

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SNF  
Edition : 05.05.94  
replaces : 07.84  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1150R172  
Type number : 0 460 416 032  
Customer Part-No. :

Customer-specific information  
Customer : SNF

Engine : WD 611.87

Power KW: 81

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 800  
Charge press. hPa: 800  
Setting value mm: 3.50...3.90

Supply-pump pressure

Speed 1/min: 800  
Charge press hPa: 800  
Setting value bar: 5.40...6.00

## Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 70.00...71.00  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 53.50...54.50

## Low-idle speed regulation

Speed 1/min: 250  
Del. quantity cm<sup>3</sup>/  
1000S.: 16.00...20.00  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

## Full-load speed regulation

Speed 1/min: 1200  
Charge press hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000S.: 38.00...42.00

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 65.00...125.00  
mind 1000S.: 65.00

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1130  
Charge press hPa: 800  
TD travel mm: 6.80...7.60  
mm: (6.50...7.90)

3rd speed 1/min: 800  
Charge press hPa: 800  
TD travel mm: 3.50...3.90  
mm: (3.00...4.40)

4th speed 1/min: 600  
Charge press hPa: 800  
TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Supply-pump pressure characteristic:

1st speed 1/min: 1130  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 6.80...7.40  
 2nd speed 1/min: 800  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 5.40...6.00  
 3rd speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 4.40...5.00

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1130  
 Charge press. hPa: 800  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 500  
 Charge-air pressure-setting point hPa: 150  
 LDA-stroke mm: 4.0  
 Del. quantity cm<sup>3</sup>/: 61.50...62.50  
 1000S.: (59.00...65.00)  
 2nd speed 1/min: 1310  
 Charge press. hPa: 800  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1250  
 Charge press. hPa: 800  
 Del. quantity cm<sup>3</sup>/: 10.00...26.00  
 1000S.: (10.00...26.00)  
 5th speed 1/min: 1200  
 Charge press. hPa: 800  
 Del. quantity cm<sup>3</sup>/: 38.00...42.00  
 1000S.: (34.00...46.00)  
 9th speed 1/min: 1130  
 Charge press. hPa: 800  
 Del. quantity cm<sup>3</sup>/: 72.00...76.00  
 1000S.: (71.00...77.00)  
 12th speed 1/min: 800  
 Charge press. hPa: 800  
 Del. quantity cm<sup>3</sup>/: 70.00...71.00  
 1000S.: (68.00...73.00)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 53.50...54.50  
 1000S.: (51.50...56.50)

Mech. shutoff:  
 Mech. Abst. ellung:

1st speed 1/min: 1130  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/: 16.00...20.00  
 1000S.: (14.00...22.00)  
 Dispersion cm<sup>3</sup>/: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 380  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 330  
 Del. quantity cm<sup>3</sup>/: 2.00...10.00  
 1000S.: (2.00...10.00)

Automatic starting fuel delivery:

1st speed 1/min: 170  
 Del. quantity cm<sup>3</sup>/: 65.00...125.00  
 1000S.: (65.00...125.00)  
 2nd speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/: 26.00...50.00  
 1000S.: (26.00...50.00)  
 4th speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/: 65.00...125.00  
 1000S.: (65.00...125.00)

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: 5.2...5.5  
 MS mm: 1.3...1.5  
 SVS max. mm: 4.0  
 LDA stroke mm: 4.0  
 Ya mm: 37.2...39.2  
 Yb mm: 48.2...56.2

Remarks:

:  
 :  
 Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1125R546  
Type number : 0 460 416 075  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT "DI"

Engine : 8065.25.230

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Charge press. hPa: 1000  
Setting value mm: 1.10...1.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Charge press hPa: 1000  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 650  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 78.50...79.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 48.00...49.00  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 7.00...11.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.0)

Full-load speed regulation

Speed 1/min: 1170  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 27.00...33.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...140.00  
mind 1000S.: 80.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 930  
Charge press hPa: 1000  
TD travel mm: 2.00...2.80  
mm: (1.50...3.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 1.10...1.50  
mm: (0.40...2.20)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 2.90...3.70  
mm: (2.40...4.20)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.10...5.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.60...7.20  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 575

Charge-air pressure-setting  
point hPa: 360  
LDA-stroke mm: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.50...58.50  
1000S.: (53.00...63.00)

2nd speed 1/min: 1280  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1170  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...33.00  
1000S.: (24.00...36.00)

8th speed 1/min: 1125  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 48.00...64.00  
1000S.: (46.00...66.00)

9th speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.50...68.50  
1000S.: (63.50...70.50)

12th speed 1/min: 650  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 78.50...79.50  
1000S.: (75.50...82.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 48.00...49.00  
1000S.: (45.00...52.00)

20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 81.00...85.00  
1000S.: (79.50...86.50)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 6.0  
1000S.: (6.0)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: MIND.95  
1000S.: -

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...60.00  
1000S.: (30.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.4
MS	mm: 2.0...2.4
Ya	mm: 34.9...36.9
Yb	mm: 38.3...43.5

Remarks:

:

:

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1150R583  
Type number : 0 460 416 077  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : D706 LT

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1200  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1200  
Setting value bar: 7.10...7.70  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1200  
Del. quantity cm3/  
1000S.: 76.00...77.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

## Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 55.50...56.50

Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 7.00...11.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1200  
Del. quantity cm3/  
1000S.: 48.00...52.00

Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...80.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 12

## Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Charge press hPa: -

Inj.-qty. cm<sup>3</sup>/  
 difference 1000S.: -15.0...-21.0 #  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 Charge press hPa: -  
 TD-travel  
 difference mm: -0.9...-1.1 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1300  
 Charge press hPa: 1200  
 TD travel mm: 2.70...3.50  
 mm: (2.20...4.00)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press hPa: 1200  
 TD travel mm: 2.40...2.80  
 mm: (1.90...3.30)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1200  
 TD travel mm: 1.30...2.10  
 mm: (0.80...2.60)  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1200  
 Supply-pump  
 pressure bar: 4.70...5.30  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press. hPa: 1200  
 Supply-pump  
 pressure bar: 7.10...7.70  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1300  
 Charge press. hPa: 1200  
 Supply-pump  
 pressure bar: 7.50...8.10  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

A07

Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 102.70...147.20  
 quantity cm<sup>3</sup>/10s: (87.70...162.20)  
 2nd speed 1/min: 1300  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.20...180.50  
 quantity cm<sup>3</sup>/10s: (82.20...195.50)

Delivery-quant. and breakaway char.:

1st speed 1/min: 660  
 Charge-air pressure-setting  
 point hPa: 550  
 LDA-stroke mm: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 75.00...76.00  
 1000S.: (72.50...78.50)  
 2nd speed 1/min: 1780  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: -  
 3rd speed 1/min: 1600  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 22.00...38.00  
 1000S.: (20.00...40.00)  
 4th speed 1/min: 1500  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 48.00...52.00  
 1000S.: (44.00...56.00)  
 5th speed 1/min: 1300  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 74.00...78.00  
 1000S.: (72.50...79.50)  
 6th speed 1/min: 1000  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 76.00...77.00  
 1000S.: (73.50...79.50)  
 7th speed 1/min: 800  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 76.50...83.50  
 1000S.: (75.00...85.00)  
 8th speed 1/min: 600

Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 86.00...90.00  
1000S.: (84.50...91.50)  
9th speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.50...56.50  
1000S.: (53.00...59.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (4.00...14.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: -11.0.-13.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):

1st speed 1/min: 1200  
Charge press. hPa: -  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 500

A08

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000S.: (30.00...70.00)

2nd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: KOT
MS1	mm: 1.0...1.3
Ya	mm: 38.6...40.6
Yb	mm: 60.5...71.5

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/11F1150R586  
Type number : 0 460 416 078  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8065.05.240

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/  
1000S.: 22.00...28.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 800  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700  
TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1150

TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 4.70...5.30

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 800

Supply-pump  
pressure bar: 6.20...6.80  
Shutoff

electromagnet Volt: 12  
4th speed 1/min: 1150

Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 1150  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000S.: (19.00...31.00)

9th speed 1/min: 1150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.50...59.50  
1000S.: (54.50...61.50)

12th speed 1/min: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.50...65.50  
1000S.: (61.00...67.00)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...64.00  
1000S.: (59.00...66.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (8.00...16.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...135.00  
1000S.: (75.00...135.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

Shutoff electromagnet:



Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.4
MS	mm: 1.1...1.3
Ya	mm: 36.5...38.5
Yb	mm: 43.7...48.9

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/12F1125R531  
Type number : 0 460 423 001  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : 3.152 R49

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 950  
Setting value mm: 0.80...1.20

Supply-pump pressure

Speed 1/min: 950  
Setting value bar: 6.30...6.90

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 65.50...66.50  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 17.00...23.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...120.00  
mind 1000S.: 60.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1125  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)  
3rd speed 1/min: 900  
TD travel mm: 0.10...0.90  
mm: (0.00...1.20)  
4th speed 1/min: 950  
TD travel mm: 0.80...1.20  
mm: (0.30...1.70)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 4.00...4.60  
2nd speed 1/min: 950  
Supply-pump  
pressure bar: 6.30...6.90  
3rd speed 1/min: 1125  
Supply-pump  
pressure bar: 7.10...7.70

Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1125  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: -  
 2nd speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: 17.00...23.00  
 1000S.: (12.00...28.00)  
 3rd speed 1/min: 1220  
 Del. quantity cm<sup>3</sup>/: 45.00...65.00  
 1000S.: -  
 4th speed 1/min: 1125  
 Del. quantity cm<sup>3</sup>/: 58.00...62.00  
 1000S.: (56.50...63.50)  
 5th speed 1/min: 700  
 Del. quantity cm<sup>3</sup>/: 65.50...66.50  
 1000S.: (63.00...69.00)  
 6th speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: 64.50...68.50  
 1000S.: (63.00...70.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1125  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/: 13.0...17.0  
 1000S.: (11.0...19.0)  
 Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: 6.00...14.0  
 1000S.: (5.00...15.0)  
 3rd speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 180  
 Del. quantity cm<sup>3</sup>/: 60.00...120.00  
 1000S.: (60.00...120.00)

2nd speed 1/min: 280  
 Del. quantity cm<sup>3</sup>/: 30.00...60.00  
 1000S.: (30.00...60.00)

4th speed 1/min: 100  
 Del. quantity cm<sup>3</sup>/: 60.00...120.00  
 1000S.: (60.00...120.00)

Mounting and assembly dimensions:

Designation

K mm: -  
 KF mm: KOT  
 MS mm: 0.7...0.9  
 XK mm: 37.2...39.2  
 XL mm: 52.1...60.1

Remarks:

:  
 :  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/12F1125R532  
Type number : 0 460 423 002  
Customer Part-No. :

Customer-specific information  
Customer : MWM

Engine : TD 226-B3

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 1.60...2.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 6.70...7.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 85.50...86.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 21.00...27.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1170  
Del. quantity cm3/  
1000S.: 52.00...58.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 109.0...111.0  
mind 1000S.: 102.0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 900  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 1.60...2.00  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700

TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 550  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 6.70...7.30

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 7.80...8.40  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Overflow : 102.7...147.2  
quantity cm<sup>3</sup>/10s: (87.70...162.2)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.20...180.50  
quantity cm<sup>3</sup>/10s: (82.20...195.50)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1280  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

2nd speed 1/min: 1240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.0...15.0  
1000S.: -

3rd speed 1/min: 1190  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: -

4th speed 1/min: 1170  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 52.00...58.00  
1000S.: (46.50...63.50)

5th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...82.50  
1000S.: (78.00...84.00)

6th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 81.50...84.50  
1000S.: (80.00...86.00)

7th speed 1/min: 900  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.5...86.5  
1000S.: (83.5...88.5)

8th speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.0...91.0  
1000S.: (84.0...92.0)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 21.0...27.0  
1000S.: (17.5...30.5)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (6.5)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 120.0...160.00  
1000S.: (120.0...160.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.00...135.0  
1000S.: (85.00...135.0)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 109.0...111.0  
1000S.: (109.0...111.0)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.5...3.7
KF	mm: KOT
MS1	mm: 1.0...1.3
XK	mm: 41.4...45.4
XL	mm: 37.0...43.0

Remarks:

:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D1  
Edition : 28.04.94  
replaces : 16.07.91  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1050R230-3  
Type number : 0 460 424 033  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA-390 IND

Power KW: 79  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0,3  
(from BDC): +0,02(0,04)

Start of delivery block  
Piston stroke mm: 1.55  
mm: +0.04(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 83.00...84.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 59.00...65.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...120.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 4.70...5.50  
mm: (4.40...5.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.70...2.50  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
TD travel mm: 0.00...6.40  
mm: (0.00...1.00)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.30...6.90

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1050  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 350  
LDA-stroke mm: 6,8

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000S.: (76.00...84.00)

2nd speed 1/min: 1120  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...50.00  
1000S.: (20.00...50.00)

4th speed 1/min: 1180  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1100  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.00...65.00  
1000S.: (56.00...68.00)

9th speed 1/min: 1050  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.50...79.50  
1000S.: (75.00...81.00)

12th speed 1/min: 900  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 83.00...84.00  
1000S.: (80.50...86.50)

18th speed 1/min: 500  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)



Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...50.00  
1000S.: (10.00...50.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5,1...5,4  
MS mm: 1,1...1,35  
SVS max. mm: 2,2  
LDA stroke mm: 6.8

XK mm: 20.2...22.2  
XL mm: 11.9...15.3

Remarks:

: C.D.C. # 3 909 593  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 05.05.94  
replaces : 15.06.92  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1300R280  
Type number : 0 460 424 037

Customer-specific information  
Customer : PERKINS

Engine : T4.40 LKW

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 950  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 950  
Charge press hPa: 1000  
Setting value bar: 4.60...5.20

A20

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 93.00...94.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 84.50...85.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 22.00...26.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1430  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 95.00...145.00  
mind 1000S.: 95.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

electromagnet Volt: 12  
2nd speed 1/min: 950

Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 950  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.00...6.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 950  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.60...5.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 2.70...3.30  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.50...139.00  
quantity cm<sup>3</sup>/10s: (40.50...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 89.00...90.00  
1000S.: (86.50...92.50)  
2nd speed 1/min: 1560  
Charge press. hPa: 1000

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...22.00  
1000S.: (11.00...25.00)  
4th speed 1/min: 1430  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 47.00...53.00  
1000S.: (44.00...56.00)  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 87.70...91.30  
1000S.: (86.50...92.50)  
6th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 93.00...94.00  
1000S.: (90.50...96.50)  
7th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.50...85.50  
1000S.: (82.00...88.00)  
8th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 92.00...96.00  
1000S.: (91.00...97.00)  
9th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.50...79.50  
1000S.: (74.50...80.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 300

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 Idle delivery:  
 1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 22.00...26.00  
 1000s.: (19.00...29.00)  
 Dispersion cm<sup>3</sup>/: 5.0  
 1000s.: (5.0)  
 2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...15.00  
 1000s.: (7.00...17.00)  
 3rd speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...2.60  
 1000s.: (0.00...2.60)

#### Automatic starting fuel delivery:

1st speed 1/min: 150  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 95.00...145.00  
 1000s.: (95.00...145.00)  
 2nd speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 62.00...72.00  
 1000s.: (62.00...72.00)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 95.00...145.00  
 1000s.: (95.00...145.00)

#### Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

#### Mounting and assembly dimensions:

##### Designation

K mm: 3.2...3.4  
 KF mm: K-OT  
 MS mm: 1.1...1.5  
 LDA stroke mm: 7.0  
 Ya mm: 37.2...39.2  
 Yb mm: 47.2...55.6

#### Remarks:

:  
 :  
 Operate control lever after each  
 manifold-pressure compensator pressure  
 change.

\* Correction at adjusting nut

Ya = Distance between VE flange and  
 speed-control lever in idle  
 position

Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position

Measurement point = edge of control  
 lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1300R280  
Type number : 0 460 424 037  
Customer Part-No. : 2 643 H05 5

Customer-specific information  
Customer : PERKINS

Engine : T4.40 LKW

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 950  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 950  
Charge press hPa: 1000

A23

Setting value bar: 4.60...5.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 93.00...94.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 84.50...85.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 22.00...26.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1530  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 95.00...145.00  
mind 1000S.: 95.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)  
electromagnet Volt: 12

2nd speed 1/min: 950  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: 1.30...2.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: 0.30...1.70

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. nPa: 1000  
Supply-pump  
pressure bar: 6.00...6.60  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 950  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.60...5.20  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 2.70...3.30  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.50...139.00  
quantity cm<sup>3</sup>/10s: (40.50...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 89.00...90.00  
1000S.: (86.50...92.50)

2nd speed 1/min: 1660

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...19.00  
1000S.: (8.00...22.00)

4th speed 1/min: 1530  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 47.00...53.00  
1000S.: (44.00...56.00)

5th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 87.70...91.30  
1000S.: (86.50...92.50)

6th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 93.00...94.00  
1000S.: (90.50...96.50)

7th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.50...85.50  
1000S.: (82.00...88.00)

8th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 92.00...96.00  
1000S.: (91.00...97.00)

9th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.50...79.50  
1000S.: (74.50...80.50)

#### Mech. shutoff: Mech. Abst llung:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

#### Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...26.00  
1000S.: (19.00...29.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...15.00  
1000S.: (7.00...17.00)

3rd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
1000S.: (95.00...145.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 62.00...72.00  
1000S.: (62.00...72.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
1000S.: (95.00...145.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: K-OT  
MS mm: 1.1...1.5  
LDA stroke mm: 7.0  
Ya mm: 37.2...39.2

Yb mm: 47.2...55.6

Remarks:

: REGELFEDER  
: 1 464 650 366

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1300R280  
Type number : 0 460 424 037  
Customer Part-No. : 2 643 H06 7

Customer-specific information  
Customer : PERKINS

Engine : T4.40 LKW

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 950  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 950  
Charge press hPa: 1000

A26

Setting value bar: 4.60...5.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 93.00...94.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 84.50...85.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 22.00...26.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1430  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
mind 1000S.: 95.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1300  
Charge press hPa: 1000  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)  
electromagnet Volt: 24



2nd speed 1/min: 950  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.00...6.60

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 950  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.60...5.20

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Supply-pump pressure bar: 2.70...3.30  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow quantity cm<sup>3</sup>/10s: 55.50...139.00  
(40.50...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 300  
LDA-stroke mm: 7.0  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 89.00...90.00  
(86.50...92.50)  
2nd speed 1/min: 1560

Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

3rd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 11.00...19.00  
(8.00...22.00)

4th speed 1/min: 1430  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 47.00...53.00  
(44.00...56.00)

5th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 87.70...91.30  
(86.50...92.50)

6th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 93.00...94.00  
(90.50...96.50)

7th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 84.50...85.50  
(82.00...88.00)

8th speed 1/min: 700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000S.: 92.00...96.00  
(91.00...97.00)

9th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/1000S.: 75.50...79.50  
(74.50...80.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 22.00...26.00  
1000S.: (19.00...29.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 9.00...15.00  
1000S.: (7.00...17.00)

3rd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
1000S.: (95.00...145.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 62.00...72.00  
1000S.: (62.00...72.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
1000S.: (95.00...145.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: K-OT  
MS mm: 1.1...1.5  
LDA stroke mm: 7.0  
Ya mm: 37.2...39.2

Yb mm: 47.2...55.6

Remarks:

:  
:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P43  
Edition : 22.04.94  
replaces : 14.04.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1100R378-7  
Type number : 0 460 424 074  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 BT-390 580K

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.8  
mm: +0.04(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Setting value mm: 2.30...2.70  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (5.0)

Low-idle speed regulation

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 6.00...12.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1170  
Del. quantity cm3/  
1000S.: 31.50...38.50  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...120.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900

TD travel mm: 2.30...2.70  
 mm: (1.80...3.20)  
 Shutoff  
 electromagnet Volt: 12  
 7.Rotacao 1/min: 650  
 TD travel mm: 0.70...1.50  
 mm: (0.40...1.80)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2.40...3.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Supply-pump  
 pressure bar: 4.10...4.70  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump  
 pressure bar: 4.90...5.50  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...86.10  
 quantity cm3/10s: (26.70...101.10)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1260  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1190  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...40.00  
 1000S.: (10.00...40.00)  
 5th speed 1/min: 1170  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 31.50...38.50  
 1000S.: (29.00...41.00)  
 9th speed 1/min: 1100

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 60.50...63.50  
 1000S.: (59.00...65.00)  
 10th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 60.80...63.80  
 1000S.: (58.80...65.80)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 63.50...64.50  
 1000S.: (61.00...67.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.00...66.00  
 1000S.: (56.00...68.00)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 1100  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 500  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

Idle delivery:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 6.00...12.00  
 1000S.: (4.00...14.00)

Dispersion cm3/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 570  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 70.00...130.00  
 1000S.: (70.00...130.00)

2nd speed 1/min: 240  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...70.00  
1000s.: (30.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000s.: (70.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.2...1.4
SVS max.	mm: 2.5
Ya	mm: 34.8...38.8
Yb	mm: 40.2...45.6

Remarks:

: C.D.C. # 3 917 528

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 05.05.94  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R374-4  
Type number : 0 460 424 089

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9

Power KW: 81  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 250...253

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.55  
mm:  $\pm 0.04(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 85.5...86.5  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1145  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 65.00...71.00  
Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 65.00...105.00  
mind 1000S.: 65.0

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)

Shutoff : 24  
2nd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 2.10...2.90  
mm: (1.80...3.20)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.70...7.30

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.10...5.70

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 97.20...138.80  
quantity cm<sup>3</sup>/10s: (82.20...153.80)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24

Overflow : 111.10...194.40  
quantity cm<sup>3</sup>/10s: (96.10...209.40)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
LDA-stroke mm: 6.6  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 81.50...82.50  
1000S.: (78.00...86.00)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

3rd speed 1/min: 1180  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: -

4th speed 1/min: 1145  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...71.00  
1000S.: (62.00...74.00)

5th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 76.00...79.00  
1000S.: (74.50...80.50)

6th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 78.50...81.50  
1000S.: (76.50...83.50)

7th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000S.: (83.00...89.00)

8th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000S.: (60.00...68.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 455  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: (35.00...65.00)

2nd speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...125.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...105.00  
1000S.: (65.00...105.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

B06

K mm: -  
KF mm: 5.0...5.4  
MS mm: 1.0...1.2  
LDA stroke mm: 6.6  
Ya mm: 34.8...38.8  
Yb mm: 40.8...46.2

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM  
Edition : 28.04.94  
replaces : 16.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F150GR492  
Type number : 0 460 424 091

Customer-specific information  
Customer : MWM

Engine : D 229 EC 4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207...210

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 5.10...5.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 6.70...7.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 59.70...60.70  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1600  
Del. quantity cm3/  
1000S.: 42.00...48.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...130.00  
mind 1000S.: 90.0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1500  
TD travel mm: 6.20...7.00  
mm: (5.90...7.30)  
Shutoff : 12  
2nd speed 1/min: 1100  
TD travel mm: 5.10...5.50  
mm: (4.60...6.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1500  
Supply-pump  
pressure bar: 8.20...8.80  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 6.70...7.30  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.20...138.80  
quantity cm<sup>3</sup>/10s: (82.20...153.80)  
2nd speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Overflow : 111.10...194.40  
quantity cm<sup>3</sup>/10s: (96.10...209.40)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 1700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...28.00  
1000S.: (11.00...31.00)  
4th speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.00...48.00  
1000S.: (39.00...51.00)  
5th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.00...57.00  
1000S.: (51.50...58.50)  
6th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 59.70...60.70  
1000S.: (57.20...63.20)  
7th speed 1/min: 900

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...65.20  
1000S.: (60.00...67.00)  
8th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 54.00...60.00  
1000S.: (52.00...62.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (11.00...19.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.50...36.50  
1000S.: (26.50...38.50)  
3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)  
4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...130.00  
1000S.: (90.00...130.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.2...5.6
MS1	mm: 1.2...1.4
Ya	mm: 42.0...44.0
Yb	mm: 36.8...45.2

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 29.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F135GR505  
Type number : 0 460 424 094  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT "DI"

Engine : 8040.45.4300

Power KW: 75  
Speed 1/min: 1350

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000

B10

Setting value mm: 3.90...4.10  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.50...74.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 48.00...49.00  
Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...10.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1550  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 19.00...25.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 3.90...4.10  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 900  
 Charge press hPa: 1000  
 TD travel mm: 1.40...2.00  
 mm: (1.00...2.40)

Shutoff  
 electromagnet Volt: 24  
 7.Rotacao 1/min: 1000  
 Charge press. hPa: 1000  
 TD travel mm: 2.70...3.30  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 700  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.70...5.30  
 Shutoff

electromagnet Volt: 24  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.20...7.80  
 Shutoff

electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 8.60...9.20  
 Shutoff  
 electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 75.00...119.50  
 quantity cm3/10s: (60.00...134.50)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 97.30...180.70  
 quantity cm3/10s: (82.30...195.70)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting point hPa: 350  
 LDA-stroke mm: 5.3  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 66.50...67.50  
 1000S.: (63.00...71.00)

2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1550  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 19.00...25.00  
 1000S.: (16.00...28.00)

9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 66.50...70.50  
 1000S.: (65.00...72.00)

10th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 69.00...73.00  
 1000S.: (67.50...74.50)

12th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quynity cm3/: 73.50...74.50  
 1000S.: (70.50...77.50)

18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 48.00...49.00  
 1000S.: (45.00...52.00)

# Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1350  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

# Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (3.00...13.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 25.00...55.00  
1000S.: (25.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.4...3.8  
KF mm: KOT  
MS1 mm: 1.1...1.4  
LDA stroke mm: 5.3  
Ya mm: 36.9...40.9  
Yb mm: 37.8...43.0

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 29.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1350R511  
Type number : 0 460 424 095  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT "DI"  
  
Engine : 8040.45.4383

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.90...3.10  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 75.50...76.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 55.50...56.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 4.00...8.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1450  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 30.00...34.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1350  
 Charge press hPa: 1000  
 TD travel mm: 4.60...5.20  
                   mm: (4.20...5.60)  
 3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 4.20...4.80  
                   mm: (3.80...5.20)  
 Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 2.90...3.10  
                   mm: (2.30...3.70)  
 Shutoff  
 electromagnet Volt: 24  
 5th speed 1/min: 800  
 Charge press. hPa: 1000  
 TD travel mm: 0.10...0.70  
                   mm: (0.00...1.10)

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.60...7.20  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 8.60...9.20  
 Shutoff  
 electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 75.00...119.50  
 quantity cm<sup>3</sup>/10s: (60.00...134.50)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 97.30...180.70  
 quantity cm<sup>3</sup>/10s: (82.30...195.70)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting point hPa: 450  
 LDA-stroke mm: 4.5  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
                           1000S.: (52.50...59.50)  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 5th speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 30.00...34.00  
                           1000S.: (26.00...38.00)  
 9th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 66.50...70.50  
                           1000S.: (65.00...72.00)  
 10th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 71.00...75.00  
                           1000S.: (69.50...76.50)  
 12th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 75.50...76.50  
                           1000S.: (72.50...79.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
                           1000S.: (52.50...59.50)

#### Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)



Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.00...8.00  
1000S.: (1.00...11.00)  
Dispersion: cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.5...3.6  
KF mm: KOT  
MS1 mm: 1.1...1.4  
LDA stroke mm: 4.5  
Ya mm: 36.9...40.9  
Yb mm: 42.4...47.6

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAX  
Edition : 29.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1400R516  
Type number : 0 460 424 096  
Customer Part-No. :

Customer-specific information  
Customer : MAXON

Engine : S4T - PLUS

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 101

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value mm: 1.90...2.10

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Del. quantity cm3/  
1000S.: 97.00...98.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 67.00...71.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 5.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1200  
Del. quantity cm3/  
1000S.: 75.50...81.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 105.00...155.00  
mind 1000S.: 105  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1400  
 Charge press hPa: 1200  
 TD travel mm: 2.10...2.90  
 mm: (1.80...3.20)  
 3rd speed 1/min: 1100  
 Charge press hPa: 1200  
 TD travel mm: 1.70...2.10  
 mm: (1.20...2.60)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 900  
 Charge press hPa: 1200  
 TD travel mm: 0.50...1.30  
 mm: (0.20...1.60)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 900  
 Charge press. hPa: 1200  
 Supply-pump pressure bar: 5.40...6.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1200  
 Supply-pump pressure bar: 6.20...6.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press. hPa: 1200  
 Supply-pump pressure bar: 7.40...8.00  
 Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.20...138.80  
 quantity cm<sup>3</sup>/10s: (82.20...153.80)  
 2nd speed 1/min: 1400  
 Charge press. hPa: 1200  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 111.10...194.40  
 quantity cm<sup>3</sup>/10s: (96.10...219.40)

# Delivery-quant. and breakaway char.:

1nd speed 1/min: 750

# Charge-air pressure-setting point hPa: 600

LDA-stroke mm: -

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 67.00...71.00  
 1000S.: (64.50...73.50)

2nd speed 1/min: 1800

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

5th speed 1/min: 1600

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...41.00  
 1000S.: (21.00...45.00)

9th speed 1/min: 1500

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 75.50...81.50  
 1000S.: (72.50...84.50)

10th speed 1/min: 1400

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 93.50...97.50  
 1000S.: (92.00...99.00)

12th speed 1/min: 1100

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quynntity cm<sup>3</sup>/: 97.00...98.00  
 1000S.: (94.50...100.50)

13th speed 1/min: 700

Charge press. hPa: 1200

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 104.0...110.0  
 1000S.: (102.0...112.0)

14th speed 1/min: 500

Charge press. hPa: -

# Shutoff

electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 67.00...71.00  
 1000S.: (64.50...73.50)

# Mech. shutoff:

# Electr. shutoff:

1st speed 1/min: 400

Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

# Shutoff

electromagnet volt: -

### Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...9.00  
1000S.: (3.00...11.00)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.0...24.0  
1000S.: (14.0...26.0)  
3rd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

### Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...80.00  
1000S.: (30.00...80.00)  
4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 105.00...155.00  
1000S.: (105.00...155.00)

### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

### Mounting and assembly dimensions:

#### Designation

K mm: 3.6...3.8  
KF mm: KOT  
MS1 mm: 1.0...1.2  
Ya mm: 35.0...37.0  
Yb mm: 44.8...53.2

#### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut

Ya = Distance between VE flange and speed-control lever in idle

position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,8 W38  
Edition : 28.04.94  
replaces : 24.04.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R320-2  
Type number : 0 460 426 139  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BT-590A

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.40  
mm:  $\pm 0.04(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1200  
Setting value mm: 1.30...1.70  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1200  
Setting value bar: 6.80...7.40  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 1200  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.00...74.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 51.00...52.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

11

## Low-idle speed regulation

Speed 1/min: 350  
Charge press hPa: -  
Del. quantity cm<sup>3</sup>/  
1000S.: 5.50...9.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1340  
Charge press hPa: 1200  
Del. quantity cm<sup>3</sup>/  
1000S.: 52.50...58.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
mind 1000S.: 70.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450\*  
Charge press hPa: 1200  
TD travel mm: 3.00...4.00  
mm: -

KSB/AFB  
valve Volt: -  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press hPa: 1200  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press hPa: 1200  
TD travel mm: 1.30...1.70  
mm: (0.80...2.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1200  
TD travel mm: 0.50...1.30  
mm: (0.20...1.60)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1250  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 7.50...8.10  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1100  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 6.80...7.40  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump  
pressure bar: 4.10...4.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1200  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700\*  
Charge-air pressure-setting  
point hPa: 700  
LDA-stroke mm: 6.8  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68.00...69.00  
1000S.: (64.50...72.50)  
2nd speed 1/min: 1550  
Charge press. hPa: 1200  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 1400

Charge press. hPa: 1200

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 15.00...55.00

1000S.: -

4th speed 1/min: 1340

Charge press. hPa: 1200

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 52.50...58.50

1000S.: (49.50...61.50)

5th speed 1/min: 1250

Charge press. hPa: 1200

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.50...73.50

1000S.: (69.00...75.00)

6th speed 1/min: 1100

Charge press. hPa: 1200

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 73.00...74.00

1000S.: (70.50...76.50)

7th speed 1/min: 750

Charge press. hPa: 1200

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 72.00...77.00

1000S.: (70.00...79.00)

8th speed 1/min: 500

Charge press. hPa: -

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 51.00...52.00

1000S.: (47.50...55.50)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1250

Charge press. hPa: 1200

Del. quantity cm<sup>3</sup>/: 0.00...3.00

1000S.: -

Shutoff

electromagnet volt: 12

KSB/AFB

valve Volt: 12

Electr. shutoff:

1st speed 1/min: 350

Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: 0.00...3.00

1000S.: (0.00...3.00)

Shutoff

electromagnet volt: -

KSB/AFB

valve Volt: 12

Idle delivery:

1st speed 1/min: 350

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 5.50...9.50

1000S.: (2.50...12.50)

Dispersion cm<sup>3</sup>/: 5.5

1000S.: (7.0)

2nd speed 1/min: 450

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...4.00

1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 30.00...50.00

1000S.: -

2nd speed 1/min: 130

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.00...130.00

4th speed 1/min: 100

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.00...130.00

1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: K0T
MS	mm: 0,8...1,2
SVS max.	mm: 1.4
LDA stroke	mm: 6,8
Ya	mm: 34.8...38.8
Yb	mm: 41.6...47.2

Remarks:

: C.D.C. # 3 917 943

:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut

Ya = Distance between VE flange and speed-control lever in idle position

Measurement point = edge of control lever on drive end

Yb = Distance between VE flange and speed-control lever in rated speed position

Measurement point = edge of control lever on distributor-head end

\* Unscrew KSB ball valve 2 mm



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 28.04.94  
replaces : 07.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R381-8  
Type number : 0 460 426 200  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6BT- 5.9 IND.

Power KW: 64  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.50  
mm:  $\pm 0.04(0.06)$

Outlet : D

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.30...3.70  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000S.: 49.50...50.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 17.00...23.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/  
1000S.: 33.50...39.50

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...90.00  
mind 1000S.: 50.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750  
TD travel mm: 3.30...3.70  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 500  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 750  
Supply-pump pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1160  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)  
5th speed 1/min: 1150  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 33.50...39.50  
1000S.: (30.50...42.50)  
12th speed 1/min: 1100

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 49.50...50.50  
1000S.: (47.00...53.00)

15th speed 1/min: 750  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 47.50...50.50  
1000S.: (45.50...52.50)

17th speed 1/min: 600  
Shutoff  
electromagnet volt: 24  
Del. quantity cm<sup>3</sup>/: 43.50...49.50  
1000H.: (42.00...51.00)

20th speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 32.50...40.50  
1000S.: (30.50...42.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 17.00...23.00  
1000S.: (15.00...25.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 480  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Automatic starting fuel delivery:

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 24

Del. quantity cm3/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 50.00...90.00  
1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.0...5.4

MS mm: 1.0...1.4

Ya mm: 34.8...38.8

Yb mm: 42.4...47.6

Remarks:

: C.D.C. # 3 922 411

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R498-2  
Type number : 0 460 426 213  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA 5.9B

Power KW: 108  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.2  
mm: +0.04(0.06)

Outlet : D

Injection-pump setting values

Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
AFB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 80.00...81.00  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 67.00...68.00  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (6.0)

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 11.00...15.00  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1350  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 55.00...61.00

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 65.00...95.00  
mind 1000S.: 65.00  
KSB/AFB  
Valve Volt: -  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 24  
7. Rotacao 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
8th speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 2.00...3.00  
mm: (1.80...3.20)

KSB/AFB  
valve Volt: 24  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 5.70...6.30  
KSB/AFB  
valve Volt: -

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.30...6.90

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.20...7.80  
KSB/AFB  
valve Volt: -

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...86.10  
quantity cm3/10s: (26.70...101.10)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 450  
LDA-stroke mm: 6.4  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

Del. quantity cm3/: 73.00...74.00  
 1000S.: (69.50...77.50)  
 2nd speed 1/min: 1480  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1425  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 10.00...40.00  
 1000S.: (10.00...40.00)  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 55.00...61.00  
 1000S.: (52.00...64.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 78.50...82.50  
 1000S.: (77.50...83.50)  
 10th speed 1/min: 1100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 81.50...84.50  
 1000S.: (79.50...86.50)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 81.00...82.00  
 1000S.: (78.50...84.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 67.00...68.00  
 1000S.: (63.50...71.50)

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24  
 KSB/AFB  
 valve Volt: -

Electr. shutoff:

1st speed 1/min: 350  
 Charge press. hPa: -  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: -

Idle delivery:

1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 11.00...15.00  
 1000S.: (8.00...18.00)

Dispersion cm3/: 5.5  
 1000S.: (7.0)

2nd speed 1/min: 410  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 75.00...115.00  
 1000S.: (75.00...115.00)

2nd speed 1/min: 200  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm3/: 60.00...90.00  
 1000S.: (60.00...90.00)

4th speed 1/min: 100

Charge press. hPa: -  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...95.00  
1000S.: (65.00...95.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS1 mm: 1.1...1.4  
SVS max. mm: 3.7  
LDA stroke mm: 6.4  
Ya mm: 34.8...38.8  
Yb mm: 43.3...48.9

Remarks:  
: # CDC 3 281 849

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R498-2  
Type number : 0 460 426 213  
Customer Part-No. : 3 282 594

Customer-specific information  
Customer : CDC

Engine : 6 BTA 5.9B

Power KW: 108  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.20  
mm: +0.04(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

CO2

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
AFB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 80.00...81.00

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 61.50...62.50

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (6.0)

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 11.00...15.00

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation



Speed 1/min: 1350  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 55.00...61.00

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 65.00...95.00  
mind 1000S.: 65.00

KSB/AFB  
Valve Volt: -  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 2.00...3.00  
mm: (1.80...3.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 850

C03

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.70...6.30  
KSB/AFB

valve Volt: -  
Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1000  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 6.30...6.90  
KSB/AFB  
valve Volt: -

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 7.20...7.80  
KSB/AFB  
valve Volt: -

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50  
KSB/AFB

valve Volt: -  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 450  
LDA-stroke mm: 6.4  
KSB/AFB  
valve Volt: -

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 75.00...76.00  
                     1000S.: (71.50...79.50)  
 2nd speed 1/min: 1480  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1425  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...40.00  
                     1000S.: (10.00...40.00)  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 55.00...61.00  
                     1000S.: (52.00...64.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 78.50...82.50  
                     1000S.: (77.50...83.50)  
 10th speed 1/min: 1100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 81.50...84.50  
                     1000S.: (79.50...86.50)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 81.00...82.00  
                     1000S.: (78.50...84.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 61.50...62.50  
                     1000S.: (58.00...66.00)

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: -

Electr. shutoff:

1st speed 1/min: 350  
 Charge press. hPa: -  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: -

Idle delivery:

1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 11.00...15.00  
                     1000S.: (8.00...18.00)

Dispersion cm3/: 5.5  
                     1000S.: (7.0)

2nd speed 1/min: 410  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 75.00...115.00  
                     1000S.: (75.00...115.00)

2nd speed 1/min: 200  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000s.: (60.00...90.00)

4th speed 1/min: 100

Charge press. hPa: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 65.00...95.00  
1000s.: (65.00...95.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.6...3.8

KF mm: KOT

MS1 mm: 1.1...1.4

SVS max. mm: 3.7

LDA stroke mm: 6.4

Ya mm: 34.8...38.8

Yb mm: 43.3...48.9

Remarks:

:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R498-2  
Type number : 0 460 426 213  
Customer Part-No. : 3 282 595

Customer-specific information  
Customer : CDC

Engine : 6 BTA 5.9B

Power KW: 108  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.20  
mm: +0.04(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

C06

## Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.90...2.30  
AFB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.30...6.90  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 80.00...81.00  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 61.50...62.50  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: (6.0)

11

## Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 11.00...15.00  
KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1350  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 55.00...61.00

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 65.00...95.00  
mind 1000S.: 65.00

KSB/AFB  
Valve Volt: -  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.20...3.00  
mm: (1.90...3.30)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

KSB/AFB  
valve Volt: -  
Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 450  
Charge press. hPa: -  
TD travel mm: 2.00...3.00  
mm: (1.80...3.20)

KSB/AFB  
valve Volt: 24  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 850

C07

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.70...6.30  
KSB/AFB

valve Volt: -

Shutoff  
electromagnet Volt: 24

2nd speed 1/min: 1000

Charge press. hPa: 1000

Supply-pump  
pressure bar: 6.30...6.90

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

3rd speed 1/min: 1250

Charge press. hPa: 1000

Supply-pump  
pressure bar: 7.20...7.80

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

4th speed 1/min: 500

Charge press. hPa: 1000

Supply-pump  
pressure bar: 3.90...4.50

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

Overflow : 41.70...86.10

quantity cm3/10s: (26.70...101.10)

2nd speed 1/min: 1250

Charge press. hPa: 1000

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

Overflow : 55.60...139.00

quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600

Charge-air pressure-setting

point hPa: 450

LDA-stroke mm: 6.4

KSB/AFB

valve Volt: -

Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 75.00...76.00  
                     1000S.: (71.50...79.50)  
 2nd speed 1/min: 1480  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1425  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 10.00...40.00  
                     1000S.: (10.00...40.00)  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 55.00...61.00  
                     1000S.: (52.00...64.00)  
 9th speed 1/min: 1250  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 78.50...82.50  
                     1000S.: (77.50...83.50)  
 10th speed 1/min: 1100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 81.50...84.50  
                     1000S.: (79.50...86.50)  
 12th speed 1/min: 850  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 81.00...82.00  
                     1000S.: (78.50...84.50)  
 18th speed 1/min: 500  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 61.50...62.50  
                     1000S.: (58.00...66.00)

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 24  
 KSB/AFB  
 valve Volt: -

Electr. shutoff:

1st speed 1/min: 350  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: -

Idle delivery:

1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 11.00...15.00  
                     1000S.: (8.00...18.00)

Dispersion cm<sup>3</sup>/: 5.5  
                     1000S.: (7.0)

2nd speed 1/min: 410  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 75.00...115.00  
                     1000S.: (75.00...115.00)

2nd speed 1/min: 200  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: -  
 Shutoff  
 electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000S.: (60.00...90.00)

4th speed 1/min: 100

Charge press. hPa: -

KSB/AFB

valve Volt: -

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 65.00...95.00  
1000S.: (65.00...95.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: 3.6...3.8

KF mm: KOT

MS1 mm: 1.1...1.4

SVS max. mm: 3.7

LDA stroke mm: 6.4

Ya mm: 34.8...38.8

Yb mm: 43.3...48.9

Remarks:

:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R579  
Type number : 0 460 426 233  
Customer Part-No. :

Customer-specific information  
Customer : FNH-GEOTECH

Engine : 7.5 L NA/DI

Power KW: 90  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 685 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.0  
mm: ±0.04(0.06)

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 600  
Setting value mm: 1.00...1.40  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 600  
Setting value bar: 5.00...5.40  
Shutoff  
electromagnet Volt: 12

## Full-load del. w/out charge press.:

Speed 1/min: 800  
Del. quantity cm3/  
1000S.: 73.50...74.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 14.50...15.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1180  
Del. quantity cm3/  
1000S.: 52.00...58.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...110.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 750  
TD travel mm: 1.40...2.20  
mm: (1.10...2.50)



Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 600  
TD travel mm: 1.00...1.40  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
TD travel mm: 0.50...1.30  
mm: (0.20...1.60)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1100  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Supply-pump  
pressure bar: 7.20...7.80  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 600  
Supply-pump  
pressure bar: 5.00...5.40  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 450  
Supply-pump  
pressure bar: 4.20...4.80  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm3/10s: (60.00...133.50)  
2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm3/10s: (112.30...195.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1260  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)  
5th speed 1/min: 1180  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 52.00...58.00  
1000S.: (47.00...63.00)  
8th speed 1/min: 1150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...60.00  
1000S.: -

9th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 67.00...71.00  
1000S.: (65.50...72.50)

12th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 73.50...74.50  
1000S.: (71.00...77.00)

18th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 64.50...65.50  
1000S.: (62.00...68.00)

20th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 54.00...60.00  
1000S.: (52.00...62.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 14.50...15.50  
1000S.: (10.00...20.00)

Dispersion cm3/: 5.0  
1000S.: (5.0)  
2nd speed 1/min: 460  
Shutoff

electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 85.00...145.00  
1000S.: -

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 51.00...81.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...150.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.2...1.6
Ya	mm: 32.8...34.8
Yb	mm: 41.4...48.0

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R584  
Type number : 0 460 426 235  
Customer Part-No. :

Customer-specific information  
Customer : FNH-GEOTECH

Engine : 7.5 L TC

Power KW: 124  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.0  
mm:  $\pm 0.04 (0.06)$

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 700  
Charge press. hPa: 1500  
Setting value mm: 1.30...1.70  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 700  
Charge press hPa: 1500  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/  
1000S.: 98.50...99.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 74.50...75.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 14.00...18.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/  
1000S.: 46.00...52.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 90.00...150.00  
mind 1000S.: 90.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 800  
Charge press hPa: 1500  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
Charge press hPa: 1500  
TD travel mm: 1.30...1.70  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1500  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1150  
Charge press. hPa: 1500  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1150  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 7.60...8.20  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 700  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 5.40...6.00  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 500  
Charge press. hPa: 1500  
Supply-pump  
pressure bar: 4.40...5.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1500

Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 1150  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1st speed 1/min: 650  
Charge-air pressure-setting  
point hPa: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...92.00  
1000S.: (88.50...94.50)

2nd speed 1/min: 1300  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1250  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.00...52.00  
1000S.: (43.00...55.00)

4th speed 1/min: 1200  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 68.00...98.00  
1000S.: -

5th speed 1/min: 1150  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.50...85.50  
1000S.: (80.50...87.50)

6th speed 1/min: 500  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 117.00...123.00  
1000S.: (115.00...125.00)

8th speed 1/min: 800  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 98.50...99.50  
1000S.: (96.00...102.00)

9th speed 1/min: 500  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 74.50...75.50  
1000S.: (71.00...79.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.00...18.00  
1000S.: (11.00...21.00)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 55.00...95.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...150.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.2...1.6
Ya	mm: 32.8...34.8
Yb	mm: 45.0...51.0

Remarks:

C15

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R584-1  
Type number : 0 460 426 237  
Customer Part-No. :

Customer-specific information  
Customer : FNN-GEOTECH

Engine : 7.5 L TC

Power kW: 105  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.0  
mm: ±0.04(0.06)

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 700  
Charge press. hPa: 1500  
Setting value mm: 1.00...1.40  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 700  
Charge press hPa: 1500  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1500  
Del. quantity cm3/  
1000S.: 84.50...85.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 60.50...61.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1180  
Del. quantity cm3/  
1000S.: 45.50...51.50  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 90.00...150.00  
mind 1000S.: 90.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 800  
Charge press hPa: 1500  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 700  
Charge press hPa: 1500  
TD travel mm: 1.00...1.40  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1500  
TD travel mm: 0.20...1.00  
mm: (0.00...1.30)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1100  
Charge press. hPa: 1500  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Charge press. hPa: 1500  
Supply-pump pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 700  
Charge press. hPa: 1500  
Supply-pump pressure bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Charge press. hPa: 1500  
Supply-pump pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1500

Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (60.00...134.50)  
2nd speed 1/min: 1100  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

Delivery-quant. and breakaway char.:

1st speed 1/min: 650  
Charge-air pressure-setting point hPa: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...77.00  
1000S.: (73.50...79.50)

2nd speed 1/min: 1210  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1180  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.50...51.50  
1000S.: (42.50...54.50)

4th speed 1/min: 1150  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.00...83.00  
1000S.: -

5th speed 1/min: 1100  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 74.00...77.00  
1000S.: (72.00...79.00)

6th speed 1/min: 500  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 99.00...105.00  
1000S.: (97.00...107.00)

8th speed 1/min: 800  
Charge press. hPa: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 84.50...85.50  
1000S.: (82.00...88.00)

9th speed 1/min: 500  
Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...61.50  
1000S.: (58.00...64.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...14.00  
1000S.: (7.00...17.00)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.00...72.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.00...150.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: KOT  
MS mm: 1.2...1.6  
Ya mm: 32.8...34.8  
Yb mm: 40.7...47.3

Remarks:

C18

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR  
Edition : 22.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R579-1  
Type number : 0 460 426 238  
Customer Part-No. :

Customer-specific information  
Customer : FNN-GEOTECH

Engine : 7.5 L TC

Power KW: 82  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Start of delivery block  
Piston stroke mm: 1.0  
mm:  $\pm 0.04(0.06)$

Outlet : B

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 1.00...1.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 6.00...6.40  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/  
1000S.: 64.50...65.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 14.50...15.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1180  
Del. quantity cm<sup>3</sup>/  
1000S.: 32.00...38.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 85.00...145.00  
mind 1000S.: 85.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 900  
TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
TD travel mm: 1.00...1.40  
mm: (0.50...1.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
TD travel mm: 0.00...0.80  
mm: (0.00...1.40)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1100  
TD travel mm: 2.00...2.80  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Supply-pump pressure bar: 7.30...7.80

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 800  
Supply-pump pressure bar: 6.00...6.40

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 450  
Supply-pump pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 75.00...119.50  
cm<sup>3</sup>/10s: (60.00...134.50)

2nd speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 97.30...180.70  
cm<sup>3</sup>/10s: (82.30...195.70)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1260  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1180  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.00...38.00  
1000S.: (27.00...43.00)  
8th speed 1/min: 1150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 54.00...64.00  
1000S.: -

9th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...65.50  
1000S.: (60.00...67.00)

12th speed 1/min: 1050  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.50...65.50  
1000S.: (62.00...68.00)

15th speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 69.50...73.50  
1000S.: (68.00...75.00)

18th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.00...70.00)

20th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...56.00  
1000S.: (48.50...57.50)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.50...15.50  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: -

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: (45.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.00...145.00

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.2...1.6
Ya	mm: 32.8...34.8
Yb	mm: 41.5...48.1

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1.9 H2  
Edition : 29.04.94  
replaces : 15.10.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R335  
Type number : 0 460 484 023  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M704 DA 13.0

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Setting value mm: 5.40...5.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1600

C22

Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/  
1000S.: 22.30...23.30

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (2.5)

Low-idle speed regulation

Speed 1/min: 390  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2700  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...16.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 27.00...53.00  
mind 1000S.: 27.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -7.00...-13.00  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1500  
TD-travel  
difference mm: -0.90...-1.10  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2500  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1600  
TD travel mm: 5.40...5.80  
mm: (4.90...6.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 1.60...2.7  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2000  
TD travel mm: 7.60...8.40  
mm: (7.30...8.70)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 2500  
Supply-pump  
pressure bar: 7.80...8.40  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1600  
Supply-pump  
pressure bar: 5.00...5.60  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 600  
Supply-pump  
pressure bar: 2.20...2.30  
Shutoff

electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40

quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2500  
Shutoff

electromagnet Volt: 12  
Overflow : 55.60...138.00  
quantity cm<sup>3</sup>/10s: (40.60...153.00)

#### Delivery-quant. and breakaway char.:

3rd speed 1/min: 2850  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 2700  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...16.00  
1000S.: (9.00...17.00)

9th speed 1/min: 2500  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.40...24.80  
1000S.: (21.30...25.90)

10th speed 1/min: 2000  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.30...24.70  
1000S.: (21.20...25.80)

12th speed 1/min: 1600  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.30...23.30  
1000S.: (20.50...25.10)

20th speed 1/min: 600  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.30...19.30  
1000S.: (14.80...20.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 390  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 390  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...12.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (2.5)

2nd speed 1/min: 440  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

4th speed 1/min: 500  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...35.00  
1000S.: (25.00...35.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...23.00  
1000S.: (13.00...23.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...53.00  
1000S.: (27.00...53.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.1...5.5
MS	mm: 1.3...1.7
Ya	mm: 37.2...39.2
Yb	mm: 42.8...51.5

Remarks:

;  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 29.04.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2400R66-15  
Type number : 0 460 494 165  
Customer Part-No. :

Customer-specific information  
Customer : VWB

Engine : 1.6L SANTANA/GOL

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel

Speed 1/min: 1500  
Setting value mm: 2.90...3.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500

C25

Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 33.00...34.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 475  
Del. quantity cm3/  
1000S.: 6.50...10.5

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 11.50...17.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2400  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
TD travel mm: 2.90...3.30  
mm: (2.40...3.80)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2400  
Supply-pump  
pressure bar: 7.00...7.60  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 400  
Supply-pump  
pressure bar: 2.10...2.70  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...138.90  
quantity cm<sup>3</sup>/10s: (40.60...153.90)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...10.00  
1000S.: (1.00...11.00)  
2nd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.50...17.50  
1000S.: (10.50...18.50)  
3rd speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.30...29.70  
1000S.: (26.20...30.80)  
4th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...34.00  
1000S.: (31.30...35.70)  
5th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.50...25.00  
1000S.: (20.50...26.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 475  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 475  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...10.50  
1000S.: (4.50...12.50)

Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

2nd speed 1/min: 650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: -

3rd speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...25.00  
1000S.: -

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...43.00  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4



KF	mm: 5.6...6.0
MS	mm: 1.2...1.6
SVS max.	mm: 1.8
Ya	mm: 38.6...40.6
Yb	mm: 50.4...63.3

Remarks:

⋮

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 28.04.94  
replaces : 02.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2500R341  
Type number : 9 460 620 003

Customer-specific information  
Customer : ISUZU

Engine : 4EC1-BADT

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating oil  
return temp. °C  
with viscometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value mm: 2.80...3.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250

C28

Charge press hPa: 700  
Setting value bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 700  
Del. quantity cm3/  
1000S.: 46.90...47.90

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: -  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 33.80...37.80

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 8.50...12.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 425  
Charge press hPa: 700  
Del. quantity cm3/  
1000S.: 19.60...25.60

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 38.00...70.00  
mind 1000S.: 38.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 700  
Inj.-qty. cm3/  
difference 1000S.: 16.00...24.00  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1250  
 Charge press hPa: 700  
 TD-travel  
 difference mm: 1.40...1.60  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620  
 Charge press hPa: 700  
 TD travel mm: 0.30...1.10  
 mm: (0.00...1.40)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press hPa: 700  
 TD travel mm: 2.80...3.20  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press hPa: 700  
 TD travel mm: 5.60...6.40  
 mm: (5.30...6.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 2250  
 Charge press hPa: 700  
 TD travel mm: 6.60...7.40  
 mm: (6.30...7.70)

Supply-pump pressure characteristic:

1st speed 1/min: 620  
 Charge press. hPa: 700  
 Supply-pump  
 pressure bar: 2.20...2.80  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 700  
 Supply-pump  
 pressure bar: 2.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2250  
 Charge press. hPa: 700  
 Supply-pump  
 pressure bar: 6.20...6.80  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600

Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm<sup>3</sup>/10s: (75.00...119.50)  
 2nd speed 1/min: 2500  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 94.50...139.00  
 quantity cm<sup>3</sup>/10s: (94.50...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 1000  
 Charge-air pressure-setting  
 point hPa: 340  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.30...44.30  
 1000S.: (41.30...46.30)

2nd speed 1/min: 2950  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...15.00  
 1000S.: (0.00...15.00)

3rd speed 1/min: 2750  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 19.60...25.60  
 1000S.: (18.60...26.60)

4th speed 1/min: 2600  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.10...34.10  
 1000S.: (26.10...34.10)

5th speed 1/min: 2500  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 34.10...37.10  
 1000S.: (33.30...37.90)

6th speed 1/min: 2300  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 44.50...47.50  
 1000S.: (43.80...48.20)

7th speed 1/min: 2000  
 Charge press. hPa: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 44.30...47.30  
 1000S.: (43.80...47.80)

8th speed 1/min: 1500  
 Charge press. hPa: 700

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.90...47.90  
1000S.: (45.10...49.70)

9th speed 1/min: 1500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.60...38.60  
1000S.: (34.10...39.10)

10th speed 1/min: 1300

Charge press. hPa: 700

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.10...49.10  
1000S.: (45.60...49.60)

11th speed 1/min: 600

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.80...37.80  
1000S.: (32.80...38.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (6.50...14.50)

Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: 700  
Inj.-qty. cm<sup>3</sup>/: 16.00...24.00  
difference 1000S.: (16.00...24.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: 700  
TD-travel : 1.40...1.60  
difference mm: (1.40...1.60)

Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.50...57.50  
1000S.: (42.50...57.50)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.00...70.00  
1000S.: (38.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.7...5.9  
MS mm: 0.8...1.0  
SVS max. mm: -

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAN  
Edition : 11.6.94  
Replaces : 11.93  
Test oil : ISO-4113

Combination no. : 0 400 674 048

Injection pump  
Pump designation : PE4A95D42ORS2662-1  
EP type number : 0 410 694 994  
Governor  
Governor design. :  
RSV350...1100A8C2222

-2R  
Governor no. : 0 420 233 339

Customer-spec. information  
Customer : HANOMAG

Engine : D944T

1st version kW : 97.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X500

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
(2.10...2.30)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 4- 3

003

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.75...12.85

Del.quantity cm<sup>3</sup>/ : 12.9...13.1

100 s: (12.7...12.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 129.0...131.0

1000 : (127.0...133.0)

Spread cm<sup>3</sup> : 3.50

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 11.80

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1185...1215

3rd rack travel in: 4.00

Speed rpm : 1205...1235  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 64...72

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.8

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 350

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00

Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.75...12.85

2nd speed rpm : 500

Rack travel in m: 13.25...13.35

3rd speed rpm : 900

Rack travel in m: 12.90...13.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 129.5...133.5  
1000 s: (127.5...135.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.80

Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 122.5...137.5  
1000 s: (120.0...140.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 7.4.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 614  
 Injection pump  
 Pump designation : PES6A95D410RS2844  
 EP type number : 0 410 896 893  
 Governor  
 Governor design. : RQV300...1400AB1065  
 -31L  
 Governor no. : 0 420 212 246

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kw : 97.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1400  
 Rack travel in mm : 8.70...8.80  
 Del. quantity cm<sup>3</sup>/ : 7.3...7.5  
 100 s: (7.1...7.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300  
 Rack travel in mm : 4.4...4.6  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s: (0.5...1.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.85...1.35  
 2nd speed rpm : 5900  
 travel mm : 3.25...3.75  
 3rd speed rpm : 640  
 travel mm : 3.65...4.15  
 4th speed rpm : 925  
 travel mm : 4.60...5.00  
 5th speed rpm : 1450  
 travel mm : 8.05...8.15

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1450  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1400

Del.quantity : 73.0...75.0  
1000 : (71.0...77.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 7.75  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1510...1540  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 300  
Rack travel in mm : 4.40...4.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm3/ : 55.5...58.5  
1000 s: (53.0...61.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 7.75  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 10.80...11.20

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 36  
Edition : 11.06.94  
Replaces : 07.04.89  
Test oil : ISO-4113

Combination no. : 0 400 863 015

Injection pump  
Pump designation : PES3A85D410/3RS2642  
EP type number : 0 410 883 989  
Governor  
Governor design. :  
RSV325...1200A2C2102

-3L  
Governor no. : 0 420 232 508

Customer-spec. information  
Customer : KHD

Engine : F3L913

1st version kw : 44.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 6.8...6.9

100 s: (6.6...7.1)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.9...8.1

Del.quantity cm3/ : 0.9...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 68.5...69.5

1000 : (66.5...71.5)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 94...102

Testing:

1st rack travel in: 9.30

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1275...1305  
3rd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1460  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 66...74

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 7.4

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.50

Speed rpm : 325

Rack travel in mm : 7.80...8.00

Rack travel in mm : 2.00

Speed rpm : 440...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 10.30...10.40

2nd speed rpm : 500

Rack travel in m: 10.70...10.90

3rd speed rpm : 750

Rack travel in m: 10.65...10.85

4th speed rpm : 875

Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

Del.quantity cm3/ : 59.0...61.0

1000 s: (56.5...63.5)

Speed rpm : 750

Del.quantity cm3/ : 59.0...61.0

1000 s: (56.5...63.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.30

Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...150.0

1000 s: (137.0...153.0)

Rack travel in mm : 19.50...21.00

Remarks:

: FENDT

APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 34  
Edition : 11.06.94  
Replaces : 30.11.93  
Test oil : ISO-4113

Combination no. : 0 400 864 070

Injection pump  
Pump designation : PES4A850410/3RS2732  
EP type number : 0 410 884 947  
Governor  
Governor design. :  
RSV325...1175A8C2223

-2L  
Governor no. : 0 420 232 484

Customer-spec. information  
Customer : KHD

Engine : F4L913

1st version kW : 56.0  
Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 6.8...6.9

100 s: (6.6...7.1)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 300

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Del.quantity : 68.0...69.0

1000 : (66.0...71.0)

Spread cm3 : 3.00

1000 : (4.50)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Testing:

1st rack travel in: 8.90

Speed rpm : 1215...1225

2nd rack travel in: 4.00

Speed rpm : 1245...1275  
3rd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1425  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 450...510

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 500  
Rack travel in m: 10.55...10.65  
4th speed rpm : 800  
Rack travel in m: 10.25...10.45

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm3/ : 61.0...63.0  
1000 s: (58.5...65.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.90  
Speed rpm : 1215...1225

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)  
Rack travel in mm : 17.70...17.90

Remarks:

: RENAULT

#### APPLICATION

Tractor (tractor engines)

D10

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 43  
Edition : 11.06.94  
Replaces : 02.08.91  
Test oil : ISO-4113

Combination no. : 0 400 864 074

Injection pump  
Pump designation : PES4A85D410/3RS2638  
EP type number : 0 410 884 950  
Governor  
Governor design. :  
RSV325..1150ADC2168-

4L  
Governor no. : 0 420 232 524

Customer-spec. information  
Customer : KHD

Engine : BF4L913T

1st version kw : 60.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 7.1...7.2

100 s: (6.9...7.4)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 9.0...9.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.4...2.4)

Spread cm3 : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 71.5...72.5

1000 : (69.5...74.5)

Spread cm3 : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 101...109

Testing:

1st rack travel in: 10.40

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1270...1300  
3rd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1500  
Speed rpm : 0.30...1.40

Tractor (tractor engines)

#### LOW IDLE 1

Control lever

position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 8.6

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 325

Rack travel in mm : 9.00...9.20

Rack travel in mm : 2.00

Speed rpm : 735...795

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.40...11.50

2nd speed rpm : 500

Rack travel in m: 12.60...12.80

3rd speed rpm : 800

Rack travel in m: 12.00...12.10

4th speed rpm : 940

Rack travel in m: 12.00...12.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800

Del. quantity cm<sup>3</sup>/ : 71.5...73.5

1000 s: (69.0...76.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm<sup>3</sup>/ : 125.0...135.0

1000 s: (122.0...138.0)

Rack travel in mm : 19.50...21.00

Remarks:

: DX3X

APPLICATION

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 11.06.94  
Replaces : 14.02.92  
Test oil : ISO-4113

Combination no. : 0 400 865 019

Injection pump  
Pump designation : PES5A80D410/3RS2526  
EP type number : 0 410 885 004  
Governor  
Governor design. :  
RSV325...1150A8C604-

1L  
Governor no. : 0 420 232 573

Customer spec. information  
Customer : KHD

Engine : F5L912

1st version kW : 62.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1130

Rack travel in mm : 12.60...12.70

Del. quantity cm<sup>3</sup>/ : 6.5...6.6

100 s: (6.3...6.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 8.9...9.1

Del. quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1130

Del. quantity : 65.0...66.0

1000 : (63.5...67.5)

Spread cm<sup>3</sup> : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 11.60

Speed rpm : 1170...1180

2nd rack travel in: 4.00

Speed rpm : 1215...1245  
3rd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 8.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 8.90...9.10  
Rack travel in mm : 2.00  
Speed rpm : 470...530

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1130  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 500  
Rack travel in m: 13.30...13.40  
4th speed rpm : 910  
Rack travel in m: 12.90...13.10

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1170...1180

Remarks:

:

APPLICATION

Installation 2300



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 11.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 400 866 177

Injection pump  
Pump designation : PES6A95D12ORS2859  
EP type number : 0 410 896 890  
Governor  
Governor design. :  
RSV410...1050AOC2260

-2R  
Governor no. : 0 420 233 342

Customer-spec. information  
Customer : CUMMINS

Engine : 6 BT

1st version kW : 150.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20  
: (2.05...2.25)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.95...11.05

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.8)

2nd speed rpm : 430

Rack travel in mm : 6.9...7.0

Del.quantity cm3/ : 1.4...1.8  
100 s: (1.1...2.0)

Spread cm3 : 0.5  
100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 1.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 81...89

Testing:

1st rack travel in: 10.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
3rd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 430  
Rack travel in mm : 6.50

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 430  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 490...550

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 10.95...11.05  
2nd speed rpm : 500  
Rack travel in m: 10.95...11.15

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.05...11.15

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 550  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 260  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 85.5...87.5  
1000 s: (83.5...89.5)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 57.0...59.0  
1000 s: (55.0...61.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1090...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 107.5...122.5  
1000 s: (105.0...125.0)  
Rack travel in mm : 13.80...14.20

Remarks:

Start-of-delivery mark 11.5° cam angle  
after start of delivery cyl. 1

Latching at 0.75 bar...0.85 bar.

Unlatching at 0.40 bar...0.50 bar

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR  
Edition : 11.6.94  
Replaces : 01.12.93  
Test oil : ISO-4113

Combination no. : 0 400 876 410

Injection pump  
Pump designation : PES6A95D41ORS2838  
EP type number : 0 410 896 895  
Governor  
Governor design. :  
RSV400...1050A2C2263

-6L  
Governor no. : 0 420 232 589

Customer-spec. information  
Customer : FNM-GEOTECH

Engine : 7.5 L5

1st version kW : 119.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.55...2.65  
: (2.50...2.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.75...10.85

Del.quantity cm3/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.8)

2nd speed rpm : 450.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.3...1.7

100 s: (1.1...2.0)

Spread cm3 : 0.5

100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 700

Del.quantity : 94.5...96.5

1000 : (92.5...98.5)

Spread cm3 : 3.50

1000 : (8.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 9.80  
Speed rpm : 1293...1298  
2nd rack travel in: 4.00  
Speed rpm : 1368...1373  
4th rack travel in: 1475  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 450  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.75...10.85  
2nd speed rpm : 600  
Rack travel in m: 10.75...10.95

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.70...10.90

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 475  
Rack travel in m: 10.15...10.25  
3rd pressure hPa : 310  
Rack travel in m: 8.80...9.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 99.0...103.0  
1000 s: (97.0...105.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 60.5...62.5  
1000 s: (58.5...64.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1293...1298

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 183.0...203.0  
1000 s: (180.0...206.0)  
Rack travel in mm : 18.30

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.50  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Hydraulic latching of starting  
delivery.

Latching at 0.75 bar...0.85 bar.

Unlatching at 0.40 bar...0.50 bar

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
 Edition : 11.06.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 926AA  
 Injection pump  
 Pump designation : PE6P110A720RS3040-2  
 EP type number : 0 411 816 774  
 Governor  
 Governor design. :  
 RQV200...1100PA555-4  
 Governor no. : 0 421 813 878

Customer-spec. information  
 Customer : SCANIA

Engine : DS11

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 104  
 Opening  
 pressure, bar : 250...253  
 Orifice plate  
 diameter mm : 0,7  
 Test lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.30...3.40  
 : (3.25...3.45)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 17.1...17.3  
 100 s: (16.8...17.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)  
 2nd speed rpm : 250  
 Rack travel in mm : 4.4...4.6  
 Del.quantity cm<sup>3</sup>/ : 1.1...1.7  
 100 s: (0.8...2.0)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
 travel mm : 1.10...1.50  
 2nd speed rpm : 350  
 travel mm : 2.30...2.90  
 3rd speed rpm : 700  
 travel mm : 4.70...5.30  
 4th speed rpm : 1050  
 travel mm : 8.40...8.60  
 5th speed rpm : 1165  
 travel mm : 9.90...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1070  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1500

Del.quantity : 171.0...173.0  
1000 : (169.0...175.0)  
Spread cm3 : 8.00  
1000 : (12.0)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 150  
Minimum rack travel: 5.50  
Speed rpm : 250  
Rack travel in mm : 4.40...4.60

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 1000  
Rack travel in m: 12.90...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.90...13.00

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1000

Del.quantity cm3/ : 160.0...168.0  
1000 s: (158.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 245.0...285.0  
1000 s: (241.0...289.0)  
Rack travel in mm : 20.00...21.00

Remarks:

:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAE 12,0 a  
Edition : 14.06.94  
Replaces : 05.10.92  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 933  
  
Injection pump  
Pump designation : PE6P110A32ORS3260  
EP type number : 0 411 816 775  
Governor  
Governor design. : RQ250/1050PA969  
Governor no. : 0 421 801 538

Customer-spec. information  
Customer : HAEP

Engine : X6130 NA

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
                  : (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 600  
  
Rack travel in mm : 12.10...12.20  
  
Del.quantity cm3/ : 13.0...13.2  
100 s : (12.7...13.4)  
  
Spread cm3 : 0.4  
100 s : (0.7)

2nd speed rpm : 250.0  
Rack travel in mm : 7.6...8.0  
Del.quantity cm3/ : 1.5...2.0  
100 s : (1.2...2.2)  
  
Spread cm3 : 0.4  
100 s : (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 500  
Rack travel in mm : 12.60...14.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Del.quantity : 130.0...132.0  
1000 : (127.5...134.5)  
  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

### 1st version

Setting point:  
Speed rpm : 500  
Rack travel in mm : 13.4

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1085...1100  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.80

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 7.8

Testing:

Speed rpm : 100

Minimum rack trave: 9.30

Speed rpm : 250

Rack travel in mm : 7.70...7.90

Rack travel in mm : 2.00

Speed rpm : 295...335

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 12.10...12.20

2nd speed rpm : 1035

Rack travel in m: 11.25...11.55

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1035

Del.quantity cm3/ : 129.5...135.5  
1000 s: (126.5...138.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1085...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 2.11.93  
Replaces : 21.09.92  
Test oil : ISO-4113

Combination no. : 0 401 846 950

Injection pump  
Pump designation : PE6P110A720RS3289  
EP type number : 0 411 816 781  
Governor  
Governor design. :  
RQV200...1100PA555-5  
Governor no. : 0 421 813 943

Customer-spec. information  
Customer : SCANIA

Engine : DS11 63A

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
: (3.25...3.45)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 17.1...17.3

100 s: (16.9...17.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.9...2.5

100 s: (1.6...2.8)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.70...1.10

2nd speed rpm : 350  
travel mm : 2.00...2.60

3rd speed rpm : 650  
travel mm : 4.90...5.50

4th speed rpm : 1145  
travel mm : 8.30...8.50

5th speed rpm : 1300  
travel mm : 9.70...10.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 171.0...173.0  
1000 : (168.0...176.0)  
Spread cm3 : 8.00  
1000 : (12.0)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 11.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1280...1310  
4th rack travel in: 1420  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...73

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 325  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 400...460

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.30...12.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 200  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 140  
Rack travel in m: 10.65...10.95

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1100  
Del.quantity cm3/ : 160.0...168.0  
1000 s: (158.0...170.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...290.0  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.50...6.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 13,8 j  
 Edition : 11.6.94  
 Replaces : 29.11.91  
 Test oil : ISO-4113

Combination no. : 0 401 846 959

Injection pump  
 Pump designation : PE6P120A720RS3293  
 EP type number : 0 411 826 801  
 Governor  
 Governor design. : RQV225...10J0PA1016  
 -6  
 Governor no. : 0 421 813 971

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8215.22.400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 14.60...14.70

---

Del.quantity cm3/ : 21.7...21.9  
 100 s: (21.4...22.2)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 375.0  
 Rack travel in mm : 7.2...7.4  
 Del.quantity cm3/ : 2.5...3.1  
 100 s: (2.2...3.4)

---

Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 7.80...8.00  
 2nd speed rpm : 225  
 travel mm : 0.60...1.00  
 3rd speed rpm : 700  
 travel mm : 3.80...4.40  
 4th speed rpm : 1300  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1110  
 Rack travel in mm : 11.90...14.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 700  
 Del.quantity : 217.0...219.0  
 1000 : (214.0...222.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 101...109

#### Testing:

1st rack travel in: 13.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 75...83

#### Testing:

Speed rpm : 300  
Minimum rack travel: 9.50  
Speed rpm : 375  
Rack travel in mm : 7.20...7.40

#### CONSTANT REGULATION

Speed rpm : 380...500

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 14.60...14.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.90...12.10

2nd pressure hPa : 260

Rack travel in m: 13.40...13.50

3rd pressure hPa : 200

Rack travel in m: 12.20...12.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm3/ : 219.0...225.0  
1000 s: (216.0...228.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 154.0...156.0  
1000 s: (151.0...159.0)

Spread cm3 : -  
1000 s: (8.00)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 245.0...275.0  
1000 s: (241.0...279.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : 27.11.92  
Test oil : ISO-4113

Combination no. : 0 401 846 964

Injection pump  
Pump designation : PE6P110A320RS3302  
EP type number : 0 411 816 787  
Governor  
Governor design. : RQ300/1000PA1012-1  
Governor no. : 0 421 801 648

Customer-spec. information  
Customer : DAF

Engine : LT 195 L

1st version kW : 195.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 3.90...4.10  
& maximum rack tra: 13.9...14.9  
Difference ° CS : 3.00...5.00

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.40...14.50

Del. quantity cm<sup>3</sup>/ : 17.3...17.5

100 s: (17.0...17.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.6...7.8

Del. quantity cm<sup>3</sup>/ : 2.7...3.2

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.1)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del. quantity : 173.0...175.0

1000 : (170.5...177.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.45  
Speed rpm : 1044...1060  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.7

Testing:

Speed rpm : 200  
Minimum rack travel: 11.00  
Speed rpm : 300  
Rack travel in mm : 7.60...7.80  
Rack travel in mm : 2.50  
Speed rpm : 350...390

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 1000  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 600

1st pressure hPa : 530  
Rack travel in m: 14.00...14.10  
2nd pressure hPa : 380  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : -  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.5...135.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.45  
Speed rpm : 1044...1060

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.60...7.80  
Del.quantity cm<sup>3</sup>/ : 27.5...32.5  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (11.0)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : 2.12.93  
Test oil : ISO-4113

Combination no. : 0 401 846 971

Injection pump  
Pump designation : PE6P110A320RS3302Z  
EP type number : 0 411 816 789  
Governor  
Governor design. : RQ300/1000PA1012-1  
Governor no. : 0 421 801 648

Customer-spec. information  
Customer : DAF

Engine : LS 195 M

1st version kW : 195.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 3.90...4.10  
& maximum rack tra: 13.5...14.5  
Difference ° CS : 3.00...5.00

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.90...14.00

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...16.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del.quantity cm<sup>3</sup>/ : 2.7...3.2

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.8

100 s: 1.10)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 165.0...167.0

1000 : (162.5...169.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.95  
Speed rpm : 1044...1060  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 11.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 850  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1000  
Rack travel in m: 13.85...14.05

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.90...14.00

Measurement

Speed 1/min : 600

1st pressure hPa : 480  
Rack travel in m: 13.50...13.60  
2nd pressure hPa : 340  
Rack travel in m: 12.50...12.70  
3rd pressure hPa : -  
Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.5...129.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.95  
Speed rpm : 1044...1060

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm: 19.50...21.00

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EFS) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 401 846 972

Injection pump  
Pump designation : PE6P110A32ORS3302Y  
EP type number : 0 411 816 790  
Governor  
Governor design. : RQ300/1000PA1012-1  
Governor no. : 0 421 801 648

Customer-spec. information  
Customer : DAF

Engine : LT 160 L

1st version kw : 160.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm. : 0,6

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0  
Rack travel in mm : 7.3...7.7  
Del.quantity cm3/ : 2.7...3.2  
100 s: (2.5...3.5)  
Spread cm3 : 0.8  
100 s: 1.10)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Aneroid pressure h: 1000  
Del.quantity : 141.0...143.0  
1000 : (138.5...145.5)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.05

Speed rpm : 1044...1060  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 11.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.50  
Speed rpm : 350...390

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 1000  
Rack travel in m: 12.95...13.15

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.00...13.10

##### Measurement

Speed 1/min : 600

1st pressure hPa : 360  
Rack travel in m: 12.70...12.80  
2nd pressure hPa : 270  
Rack travel in m: 12.00...12.20  
3rd pressure hPa : -  
Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

##### Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm3/ : 108.5...110.5  
1000 s: (106.0...113.0)

#### BREAKAWAY

#### 1st version

E04

1mm rack travel less than

full load rack tr: 12.05  
Speed rpm : 1044...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : 3.12.93  
Test oil : ISO-4113

Combination no. : 0 401 846 982

Injection pump  
Pump designation : PE6P110A320RS3302X  
EP type number : 0 411 816 794  
Governor  
Governor design. : RQ300/1000PA1012-1  
Governor no. : 0 421 801 648

Customer-spec. information  
Customer : DAF

Engine : LS 160 M

1st version kW : 160.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness : 8.00x2.50x600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 3.90...4.10  
& maximum rack tra: 12.5...13.5  
Difference ° CS : 3.00...5.00

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.95...14.15

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 7.1...7.3

Del.quantity cm<sup>3</sup>/ : 2.7...3.2

100 s: (2.5...3.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 144.0...146.0

1000 : (141.5...148.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.05  
Speed rpm : 1044...1060  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 11.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 345...385

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 1000  
Rack travel in m: 12.95...13.15

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 850  
Pressure hPa : 1000  
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 600  
1st pressure hPa : 310  
Rack travel in m: 12.60...12.70  
2nd pressure hPa : 220  
Rack travel in m: 11.90...12.10  
3rd pressure hPa : -  
Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 110.5...112.5  
1000 s: (108.0...115.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.05  
Speed rpm : 1044...1060

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 08.06.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 036 755  
  
Injection pump  
Pump designation :  
PES6P120A720/3LS3255  
-2  
EP type number : 0 412 026 768  
Governor  
Governor design. : RQ300/1000PA813-23  
Governor no. : 0 421 801 710

Customer-spec. information  
Customer : MAN

Engine : D2866LU08

1st version kW : 230.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

E07

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 14.50...15.50  
Firing order : 6- 2- 4- 1- 5-  
3

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.85...13.95

Del.quantity cm3/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.5

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 204.0...206.0

1000 : (201.0...209.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 750

Rack travel in mm : 15.5

Testing:

1st rack travel in: 12.90  
Speed rpm : 1045...1061  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1260  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 9.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.85...13.95

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.20...11.50  
2nd pressure hPa : 110  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 450  
Rack travel in m: 13.15...13.45

START CUT-OUT

Speed 1/min : 220 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 209.0...215.0  
1000 s: 206.0...218.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 119.0...121.0  
1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1045...1061

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

: MAN-VR. 3-7336

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : NAV  
Edition : 26.5.94  
Replaces : 15.06.93  
Test oil : ISO-4113

Combination no. : G 402 046 841

Injection pump  
Pump designation : PES6P100A320LS3309  
EP type number : 0 412 006 704  
Governor  
Governor design. : RQV350...1300PA1042  
-4K  
Governor no. : 0 421 815 328

Customer spec. information  
Customer : NAVISTAR

Engine : DTA-408

1st version kW : 171.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 076

Inlet press., bar : 2.80

Overflow  
quantity min. 1/h: 240...260

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
: (2.90...3.10)  
Rack travel in mm : 14.00...17.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 14.4...14.6

100 s: (14.2...14.8)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.4...1.8

100 s: (1.2...2.1)

Spread cm3 : 0.4

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.60...2.00

2nd speed rpm : 500  
travel mm : 3.80...4.20

3rd speed rpm : 800  
travel mm : 5.80...6.20

4th speed rpm : 1300  
travel mm : 8.90...9.10

5th speed rpm : 1500  
travel mm : 10.40...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200

Del.quantity : 144.5...146.5  
1000 : (142.5...148.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1340...1370  
2nd rack travel in: 4.00  
Speed rpm : 1510...1520  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...80

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.50  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 355...525

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 1300  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 700  
Rack travel in m: 11.80...12.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1300  
Pressure hPa : 1200  
Rack travel mm : 12.80...13.00

Measurement  
Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 300  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 890

Rack travel in m: 11.70...12.10

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1300  
Del.quantity cm3/ : 151.5...155.5  
1000 s: (149.5...157.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 900  
Del.quantity cm3/ : 65.0...69.0  
1000 s: (63.0...71.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1340...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 14.5...18.5  
1000 s: (12.0...21.0)  
Spread cm3 : 4.00  
1000 s: (6.50)

Remarks:  
: NAVISTAR  
#1819917C91

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : NAV  
Edition : 14.10.93  
Replaces : 08.93  
Test oil : ISO-4113

Combination no. : 0 402 046 846

Injection pump  
Pump designation : PES6P100A320LS3309  
EP type number : 0 412 006 704  
Governor  
Governor design. : RGV350...1300PA1042  
-7K  
Governor no. : 0 421 815 331

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-408

1st version kW : 130.5  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 058

Inlet press., bar : 2.80

Overflow  
quantity min. 1/h: 240...260

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
: (2.90...3.10)  
Rack travel in mm : 14.00...17.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 10.0...10.2

100 s: (9.8...10.4)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 1.4...1.8

100 s: (1.2...2.1)

Spread cm3 : 0.4

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.60...2.00

2nd speed rpm : 500  
travel mm : 3.80...4.20

3rd speed rpm : 800  
travel mm : 5.80...6.20

4th speed rpm : 1300  
travel mm : 8.90...9.10

5th speed rpm : 1500  
travel mm : 10.40...10.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 7.00...13.00

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 100.0...102.0  
1000 : (98.0...104.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 116...124

### Testing:

1st rack travel in: 10.70  
Speed rpm : 1360...1390  
2nd rack travel in: 4.00  
Speed rpm : 1500...1510  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 71...79

### Testing:

Speed rpm : 275  
Minimum rack trave: 6.20  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

## CONSTANT REGULATION

Speed rpm : 350...520

## TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 1300  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 700  
Rack travel in m: 10.30...10.70

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : 1200  
Rack travel mm : 11.70...11.90

## Measurement

Speed 1/min : 1300

E12

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 270  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 580  
Rack travel in m: 11.10...11.50

## START CUT-OUT

Speed 1/min : 280 (290)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 122.0...126.0  
1000 s: (120.0...128.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 69.0...73.0  
1000 s: (67.0...75.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1360...1390

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 14.5...18.5  
1000 s: (12.0...21.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (6.50)

## Remarks:

: NAVISTAR  
#1819923C91

## Bow dimension:

Sliding-sleeve position = 37.0 mm  
Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1  
start of delivery

Delivery-valve spring pre-tension =  
6.30...6.40 mm.

Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : NAV  
Edition : 26.5.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 046 848

Injection pump  
Pump designation : PES6P100A320LS3325  
EP type number : 0 412 006 709  
Governor  
Governor design. : RQV350...1200PA1042  
-8K  
Governor no. : 0 421 815 346

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 205.5  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 076

Inlet press., bar : 2.80

Overflow  
quantity min. 1/h: 240...260

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
: (2.90...3.10)  
Rack travel in mm : 14.00...17.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800  
Rack travel in mm : 15.20...15.30  
Del.quantity cm<sup>3</sup>/ : 17.4...17.6  
100 s: (17.2...17.8)

Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

2nd speed rpm : 350.0  
Rack travel in mm : 6.9...7.1  
Del.quantity cm<sup>3</sup>/ : 1.8...2.2  
100 s: (1.5...2.4)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00  
2nd speed rpm : 500  
travel mm : 3.50...3.90  
3rd speed rpm : 800  
travel mm : 6.20...6.60  
4th speed rpm : 1250  
travel mm : 9.30...9.50  
5th speed rpm : 1400  
travel mm : 10.50...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 800  
Aneroid pressure h: 1200

Del.quantity : 174.5...176.5  
1000 : (172.5...178.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...127

Testing:  
1st rack travel in: 14.60  
Speed rpm : 1240...1275  
2nd rack travel in: 4.00  
Speed rpm : 1450...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...82

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.60  
Speed rpm : 350  
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION  
Speed rpm : 350...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 15.20...15.30  
2nd speed rpm : 1200  
Rack travel in m: 15.60...15.80  
3rd speed rpm : 450  
Rack travel in m: 13.00...13.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1200  
Rack travel mm : 15.60...15.80

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 10.10...10.50  
2nd pressure hPa : 405  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 815

Rack travel in m: 14.00...14.40

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (180.0...188.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 800  
Del.quantity cm3/ : 69.0...71.0  
1000 s: (66.0...74.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.60  
Speed rpm : 1240...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...160.0  
1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 4.00  
1000 s: (6.50)

Remarks:  
: NAVISTAR  
#1819924C91

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 046 856  
Injection pump  
Pump designation : PE6P110A32ORS3329Z  
EP type number : 0 412 016 744  
Governor  
Governor design. : RQV325...1300PA1119  
Governor no. : 0 421 814 083

Customer-spec. information  
Customer : DAF

Engine : NS133M

1st version kw : 133.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 19.00...21.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 325.0  
Rack travel in mm : 5.1...5.3  
Del.quantity cm<sup>3</sup>/ : 2.3...2.8  
100 s: (2.1...3.1)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1450  
Rack travel in mm : 9.50...12.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 145.0...147.0  
1000 : (142.0...150.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 10.85  
Speed rpm : 1337...1347

2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 225  
Minimum rack trave: 8.80  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 700  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 1300  
Rack travel in m: 11.80...11.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 600

1st pressure hPa : 310  
Rack travel in m: 10.50...10.60  
2nd pressure hPa : 130  
Rack travel in m: 7.75...7.95  
3rd pressure hPa : -  
Rack travel in m: 6.50...6.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 143.0...147.0  
1000 s: (140.0...150.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 87.0...89.0  
1000 s: (84.5...91.5)

BREAKAWAY

E17

1st version  
1mm rack travel less than

full load rack tr: 10.85  
Speed rpm : 1337...1347

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 6.50...6.70

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 11.6.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 046 861  
Injection pump  
Pump designation : PE6P110A320RS3329  
EP type number : 0 412 016 743  
Governor  
Governor design. : RQ325/1300PA1150  
Governor no. : 0 421 801 716

Customer-spec. information  
Customer : DAF

Engine : NS156M

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 19.00...21.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 14.3...14.5

100 s: (14.0...14.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 325.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 2.3...2.8

100 s: (2.1...3.1)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 143.0...145.0

1000 : (140.0...148.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:



1st rack travel in: 10.85  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1435...1465  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.50

#### Testing:

Speed rpm : 225  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 415

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 700  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 1300  
Rack travel in m: 11.80...11.90

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.80...11.90

##### Measurement

Speed 1/min : 600

1st pressure hPa : 370  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 200  
Rack travel in m: 8.45...8.65  
3rd pressure hPa : -  
Rack travel in m: 7.05...7.25

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (140.0...150.0)  
Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 97.5...99.5  
1000 s: (95.0...102.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.85  
Speed rpm : 1340...1350

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE  
Edition : 11.6.94  
Replaces : 13.12.93  
Test oil : ISO-4113  
  
Combination no. : 0 402 638 807  
  
Injection pump  
Pump designation : PE8P120A120LS7127  
EP type number : 0 412 628 817  
Governor  
Governor design. : RQ300/1100PA134-3  
Governor no. : 0 421 801 655

Customer spec. information  
Customer : SNF

Engine : WD 815.72/73

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 105  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00

E20

Firing order : 1- 5- 4- 8- 6-  
                  7- 2

Phasing :  
0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)  
  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 500  
  
Rack travel in mm : 14.50...14.60  
  
Del. quantity cm<sup>3</sup>/ : 14.2...14.4  
                  100 s : (13.9...14.7)  
  
Spread cm<sup>3</sup> : 0.5  
                  100 s : (0.9)  
  
2nd speed rpm : 300.0  
Rack travel in mm : 6.3...6.9  
Del. quantity cm<sup>3</sup>/ : 1.7...2.3  
                  100 s : (1.4...2.6)  
Spread cm<sup>3</sup> : 0.8  
                  100 s : (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 15.40...16.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 500  
Aneroid pressure h: 1500  
Del. quantity : 235.0...241.0  
                  1000 : (232.0...244.0)  
Spread cm<sup>3</sup> : 5.00  
                  1000 : (9.00)

## RATED SPEED

1st version  
  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.0  
  
Testing:  
1st rack travel in: 13.30  
Speed rpm : 1145...1161

2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.40...14.70  
2nd speed rpm : 500  
Rack travel in m: 14.40...14.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 14.40...14.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 790  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 490  
Rack travel in m: 11.15...11.35

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1100  
Del.quantity cm3/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm3 : 12.00  
1000 s: (15.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...147.0)

Spread cm3 : 5.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1145...1161

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...210.0  
1000 s: (176.0...214.0)  
Rack travel in mm : 15.50...16.50

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE  
Edition : 11.6.94  
Replaces : 13.12.93  
Test oil : ISO-4113

Combination no. : 0 402 638 808

Injection pump  
Pump designation : PE8P120A120LS7127  
EP type number : 0 412 628 817  
Governor  
Governor design. :  
RQV300...1100PA785-3  
Governor no. : 0 421 814 004

Customer-spec. information  
Customer : SNF

Engine : WD 815.72/73

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 4- 8- 6-  
3-  
7- 2

Phasing :  
0-45-90-135-180-225-

270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.50...14.60

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (13.9...14.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.9

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.95...1.35

2nd speed rpm : 355  
travel mm : 1.70...2.20

3rd speed rpm : 410  
travel mm : 2.20...2.70

4th speed rpm : 1150  
travel mm : 8.35...8.65

5th speed rpm : 1390  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1220

Rack travel in mm : 11.50...14.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 1500  
Del.quantity : 235.0...241.0  
1000 : (232.0...244.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 103...111

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 150  
Minimum rack travel: 8.60  
Speed rpm : 250  
Rack travel in mm : 6.50...6.70

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.40...14.70  
2nd speed rpm : 500  
Rack travel in m: 14.40...14.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 14.40...14.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 790  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 520  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm<sup>3</sup> : 12.00  
1000 s: (15.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### BREAKAWAY

1st version  
1mm rack travel less than  
  
full load rack tr: 13.40  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...210.0  
1000 s: (176.0...214.0)  
Rack travel in mm : 15.50...16.50

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.6.94  
Replaces : 14.12.93  
Test oil : ISO-4113

Combination no. : 0 402 646 612

Injection pump  
Pump designation : PE6P120A320RS7248  
-10X  
EP type number : 0 412 626 907  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 200 M

1st version kW : 200.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 12.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.2...12.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 17.1...17.3

100 s: (16.8...17.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 550  
Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 171.0...173.0  
1000 : (168.0...176.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.75  
Speed rpm : 1184...1200  
2nd rack travel in: 4.00  
Speed rpm : 1255...1285  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.9

Testing:

Speed rpm : 175  
Minimum rack trave: 7.00  
Speed rpm : 275  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 320...360

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 600

1st pressure hPa : 340  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 200  
Rack travel in m: 10.10...10.30  
3rd pressure hPa : -  
Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 120.5...122.5  
1000 s: (117.5...125.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.75  
Speed rpm : 1184...1200

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.6.94  
Replaces : 15.12.93  
Test oil : ISO-4113

Combination no. : 0 402 646 613

Injection pump  
Pump designation : PE6P120A320RS7248  
-10W  
EP type number : 0 412 626 908  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 180 M

1st version kw : 180.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.2...12.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 15.3...15.5

100 s: (15.0...15.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 153.0...155.0  
1000 : (150.0...158.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED



1st version

Setting point:

Speed rpm : 550  
Rack travel in mm : 15.8

Testing:

1st rack travel in: 9.75  
Speed rpm : 1184...1200  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275  
Rack travel in mm : 4.9

Testing:

Speed rpm : 175  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 4.80...5.00  
Rack travel in mm : 2.00  
Speed rpm : 320...360

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 1150  
Rack travel in m: 10.65...10.85

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 240  
Rack travel in m: 9.90...10.10  
3rd pressure hPa : -  
Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

E27

Aneroid pressure h: -

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 121.5...123.5  
1000 s: (118.5...126.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.75  
Speed rpm : 1184...1200

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
 Edition : 13.6.94  
 Replaces : 15.12.93  
 Test oil : ISO-4113

Combination no. : 0 402 646 614

Injection pump  
 Pump designation : PE6P120A320RS7248  
 -10W

EP type number : 0 412 626 908  
 Governor  
 Governor design. : RQV275...1150PA986  
 Governor no. : 0 421 813 920

Customer-spec. information  
 Customer : DAF

Engine : RS 180 M

1st version kW : 180.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
 & maximum rack tra: 11.2...12.2  
 Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del. quantity cm<sup>3</sup>/ : 15.3...15.5

100 s: (15.0...15.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.6

Del. quantity cm<sup>3</sup>/ : 1.3...1.9  
 100 s: (1.0...2.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.19...1.69

2nd speed rpm : 365

travel mm : 2.27...2.77

3rd speed rpm : 450

travel mm : 2.82...3.32

4th speed rpm : 799

travel mm : 4.96...5.46

5th speed rpm : 1206

travel mm : 7.99...8.49

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 8.40...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h : 1000  
Del.quantity : 153.0...155.0  
1000 : (150.0...158.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 9.75  
Speed rpm : 1187...1197  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 175  
Minimum rack travel: 7.40  
Speed rpm : 275  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 315...365

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 1150  
Rack travel in m: 10.65...10.85

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

Measurement

F01

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 240  
Rack travel in m: 9.90...10.10  
3rd pressure hPa : -  
Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 121.5...123.5  
1000 s: (118.5...126.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack in: 9.75  
Speed rpm : 1187...1197

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 13.6.94  
Replaces : 14.12.93  
Test oil : ISO-4113

Combination no. : 0 402 646 615

Injection pump  
Pump designation : PE6P120A32ORS7248  
-1GX  
EP type number : 0 412 626 907  
Governor  
Governor design. : RQV275...1150PA986  
Governor no. : 0 421 813 920

Customer-spec. information  
Customer : DAF

Engine : RS 200 M

1st version kW : 200.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

F02

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 12.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.2...12.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 17.1...17.3

100 s: (16.8...17.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.19...1.69

2nd speed rpm : 365

travel mm : 2.27...2.77

3rd speed rpm : 450

travel mm : 2.82...3.32

4th speed rpm : 799

travel mm : 4.96...5.46

5th speed rpm : 1206

travel mm : 7.99...8.49

GUIDE SLEEVE POSITION  
Control-lever position

Degree: -1  
Speed rpm : 1335  
Rack travel in mm : 9.00...11.60

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 171.0...173.0  
1000 : (168.0...176.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 115...123

##### Testing:

1st rack travel in: 10.75  
Speed rpm : 1187...1197  
2nd rack travel in: 4.00  
Speed rpm : 1290...1320  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 78...86

##### Testing:

Speed rpm : 175  
Minimum rack trave: 7.40  
Speed rpm : 275  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 315...421

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 1150  
Rack travel in m: 11.65...11.85

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.70...11.80

#### Measurement

F03

Speed 1/min : 600

1st pressure hPa : 340  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 200  
Rack travel in m: 10.10...10.30  
3rd pressure hPa : -  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 120.5...122.5  
1000 s: (117.5...125.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 10.75  
Speed rpm : 1187...1197

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : TAT  
Edition : 13.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 616

Injection pump  
Pump designation : PE6P120A320LS7278  
EP type number : 0 412 626 880  
Governor  
Governor design. : RQV325...100PA1058  
Governor no. : G 421 814 047

Customer spec. information  
Customer : TAT

Engine : M640S

1st version kW : 242.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 13.40...13.50  
Del. quantity cm<sup>3</sup>/ : 23.2...23.4  
100 s: (22.9...23.7)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 4.8...5.4  
Del. quantity cm<sup>3</sup>/ : 2.1...2.7  
100 s: (1.8...3.0)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.30...1.80  
2nd speed rpm : 404  
travel mm : 2.16...2.66  
3rd speed rpm : 500  
travel mm : 3.10...3.60  
4th speed rpm : 764  
travel mm : 5.52...6.02  
5th speed rpm : 1056  
travel mm : 8.41...8.81

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100  
Rack travel in mm : 11.00...13.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000  
Aneroid pressure h: 1500  
Del.quantity : 232.0...234.0  
1000 : (229.0...237.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 12.45  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.70  
Speed rpm : 325  
Rack travel in mm : 4.80...5.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 1000  
Rack travel in m: 12.95...13.05  
3rd pressure hPa : 520  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 141.0...145.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.45  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 290.0...330.0  
1000 s: (286.0...334.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 7.6.94  
Replaces : 05.94  
Test oil : ISO-4113

Combination no. : 0 402 648 928

Injection pump  
Pump designation : PE8P120A320LS7847-2  
EP type number : 0 412 628 835  
Governor  
Governor design. : RQ300/1050PA1030-19  
Governor no. : 0 421 801 748

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3-  
5- 4- 1

Phasing :  
0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550  
Rack travel in mm : 14.75...14.85  
Del. quantity cm3/ : 23.8...24.0  
100 s: (23.5...24.3)  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 300  
Rack travel in mm : 5.40...6.00  
Del. quantity cm3/ : 1.0...1.6  
100 s: (0.7...1.9)  
Spread cm3 : 0.6  
100 s: (1.0)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 1200  
Del. quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1090...1106  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205



4th rack travel in: 1350  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 14.75...14.85  
2nd speed rpm : 1050  
Rack travel in m: 13.95...14.15  
3rd speed rpm : 950  
Rack travel in m: 14.10...14.30  
4th speed rpm : 775  
Rack travel in m: 14.70...14.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 400  
Pressure hPa : 1200  
Rack travel mm : 14.75...14.85

#### Measurement

Speed 1/min : 400  
1st pressure hPa : 450  
Rack travel in m: 12.80...13.00  
2nd pressure hPa : 300  
Rack travel in m: 11.75...12.05  
3rd pressure hPa : -  
Rack travel in m: 10.25...10.55

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 210.0...214.0  
1000 s: (207.0...217.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 450  
Speed rpm : 400

Del.quantity cm3/ : 164.5...167.5  
1000 s: (161.5...170.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 104.0...106.0  
1000 s: (101.0...109.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1090...1106

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 02.94  
Replaces : 10.93  
Test oil : ISO-4113

Combination no. : 0 402 648 933

Injection pump  
Pump designation : PE8P120A320LS7847  
EP type number : 0 412 628 863  
Governor  
Governor design. : RQ300/950PA1031-3  
Governor no. : 0 421 801 646

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3-  
5-

4- 1

Phasing :  
0-45-90-135-180-225-

270-315  
Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.55...13.65

Del.quantity cm3/ : 23.8...24.0

100 s: (23.5...24.3)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300  
Rack travel in mm : 5.2...5.8  
Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108...110

Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 1200  
Del.quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 93.0...101.0

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.00  
Speed rpm : 990...1006  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 69.0...77.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.90  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 13.55...13.65  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 900  
Rack travel in m: 13.15...13.25  
4th speed rpm : 875  
Rack travel in m: 13.20...13.40  
5th speed rpm : 800  
Rack travel in m: 13.55...13.65

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 400  
Pressure hPa : 1200  
Rack travel mm : 13.55...13.65

Measurement

Speed 1/min : 400

1st pressure hPa : 450  
Rack travel in m: 12.10...12.20  
2nd pressure hPa : 300

F09

Rack travel in m: 11.35...11.55  
3rd pressure hPa : -  
Rack travel in m: 10.65...10.95

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del. quantity cm<sup>3</sup>/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 450  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 160.5...163.5  
1000 s: (157.5...166.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 107.0...109.0  
1000 s: (104.0...112.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 990...1006

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

Note remarks

Combination no. : 0 402 648 933

1st version  
Speed rpm : 550  
Aneroid pressure h: 1200  
Del. quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 93.0...101.0

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 13.0  
Speed rpm : 990...1006  
2nd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 69.0...77.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 400...440

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 550  
Rack travel in m: 14.75...14.85  
2nd speed rpm : 950  
Rack travel in m: 13.9...14.1  
3rd speed rpm : 900  
Rack travel in m: 14.0...14.2  
4th speed rpm : 875  
Rack travel in m: 14.15...14.35  
5th speed rpm : 800  
Rack travel in m: 14.65...14.85

Aneroid/Altitude  
Compensator Test

1st version

F11

Setting  
Speed rpm : 400  
Pressure hPa : 1200  
Rack travel mm : 14.75...14.85

Measurement  
Speed 1/min : 400

1st pressure hPa : 450  
Rack travel in m: 12.8...13.0  
2nd pressure hPa : 300  
Rack travel in m: 11.75...12.05  
3rd pressure hPa : -  
Rack travel in m: 10.25...10.55

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 950  
Del. quantity cm3/ : 212.0...216.0  
1000 s: (209.0...219.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 450  
Speed rpm : 400  
Del. quantity cm3/ : 164.5...167.5  
1000 s: (161.5...170.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm3/ : 107.0...109.0  
1000 s: (104.0...112.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.0  
Speed rpm : 990...1006

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.0...19.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (10.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 8.6.94  
Replaces : 4.94  
Test oil : ISO-4113

Combination no. : 0 402 648 936

Injection pump  
Pump designation :  
PE8P120A320LS7840-10  
EP type number : 0 412 628 856  
Governor  
Governor design. : RQ300/950PA1032-14  
Governor no. : 0 421 801 749

Customer-spec. information  
Customer : MERCEDES-BENZ.

Engine : OM442 A

1st version kW : 250.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

F13

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3-  
5-  
4- 1

Phasing :  
0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 13.40...13.50  
Del. quantity cm<sup>3</sup>/ : 21.1...21.3  
100 s: (20.8...21.6)  
Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)  
2nd speed rpm : 300  
Rack travel in mm : 6.2...6.8  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 750  
Del. quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.45  
Speed rpm : 990...1006  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 400  
Pressure hPa : 400  
Rack travel mm : 12.35...12.45

Measurement

Speed 1/min : 400

1st pressure hPa : 750  
Rack travel in m: 13.40...13.50  
2nd pressure hPa : 200  
Rack travel in m: 11.50...11.70  
3rd pressure hPa : -  
Rack travel in m: 11.00...11.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750  
Speed rpm : 950  
Del.quantity cm3/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 400  
Speed rpm : 400

Del.quantity cm3/ : 156.5...159.5  
1000 s: (153.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.45  
Speed rpm : 990...1006

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:



Note remarks

Combination no. : 0 402 648 938

## TEST BENCH REQUIREMENTS

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

F15

```
1st version
Control lever
  position degrees: 91.0...99.0
```

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1090...1106  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 69.0...77.0  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.70...12.90  
2nd speed rpm : 900  
Rack travel in m: 12.95...13.05  
3rd speed rpm : 800  
Rack travel in m: 13.40...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 400  
Pressure hPa : 400  
Rack travel mm : 12.35...12.45

Measurement

Speed 1/min : 400

1st pressure hPa : 750  
Rack travel in m: 13.40...13.50  
2nd pressure hPa : 200  
Rack travel in m: 11.50...11.70  
3rd pressure hPa : -  
Rack travel in m: 11.00...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750  
Speed rpm : 1050  
Del.quantity cm3/ : 192.0...196.0  
1000 s: (189.0...199.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 400  
Speed rpm : 400  
Del.quantity cm3/ : 156.5...159.5  
1000 s: (153.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1090...1106

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 50.0...70.0  
1000 s: (46.0...74.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 10,0 c3  
Edition : 13.06.94  
Replaces : 01.02.91  
Test oil : ISO-4113

Combination no. : 0 402 735 803

Injection pump  
Pump designation :  
PES5P120A720/3LS7210  
EP type number : 0 412 725 808  
Governor  
Governor design. :  
RQV325...1000PA960-3

K  
Governor no. : 0 421 815 271

Customer-spec. information  
Customer : MAN

Engine : D2865LF06/LU06

1st version kW : 235.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60  
& maximum rack tra: 15.0...16.0  
Difference ° CS : 1.75...3.25

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 26.9...27.1

100 s: (26.6...27.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 5.9...6.3

Del.quantity cm3/ : 4.7...5.3

100 s: (4.4...5.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 9.40...9.60

2nd speed rpm : 325

travel mm : 1.30...1.50

3rd speed rpm : 500

travel mm : 3.20...3.80

4th speed rpm : 900

travel mm : 7.60...8.00

5th speed rpm : 1350

travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1  
Speed rpm : 1110  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 269.0...271.0  
1000 : (266.0...274.0)  
Spread cm3 : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 293...301

Testing:

1st rack travel in: 12.10  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 249...257

Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 325  
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 340...450

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 650  
Rack travel in m: 12.70...12.90  
4th speed rpm : 400  
Rack travel in m: 11.90...12.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 900

F18

Pressure hPa : 1200  
Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 170

Rack travel in m: 9.60...9.70

3rd pressure hPa : 600

Rack travel in m: 12.00...12.40

START CUT-OUT

Speed 1/min : 245 (265)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 248.0...254.0  
1000 s: (245.0...257.0)  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 270.0...276.0  
1000 s: (267.0...279.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 159.0...161.0  
1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...200.0  
1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.90...6.30  
Del.quantity cm3/ : 47.0...53.0  
1000 s: (44.0...56.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 3-7124

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 5  
start of delivery



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 15.06.93  
Replaces : 03.93  
Test oil : ISO-4113  
  
Combination no. : 0 402 736 834  
  
Injection pump  
Pump designation : PES6P120A120RS7265  
EP type number : 0 412 726 882  
Governor  
Governor design. : RQV350...1100PA964  
-12K  
Governor no. : 0 421 815 323

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kw : 186.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.8

Del.quantity cm3/ : 2.0...2.6

100 s: (1.8...2.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 2.10...2.40

2nd speed rpm : 450  
travel mm : 3.20...3.60

3rd speed rpm : 900  
travel mm : 5.60...6.00

4th speed rpm : 1200  
travel mm : 8.10...8.30

5th speed rpm : 1400  
travel mm : 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200

Del.quantity : 211.5...213.5  
1000 : (208.5...216.5)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1245...1275  
2nd rack travel in: 4.00  
Speed rpm : 1390...1400  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.30  
Speed rpm : 350  
Rack travel in mm : 6.40...6.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 650  
Rack travel in m: 12.00...12.40  
3rd speed rpm : 1200  
Rack travel in m: 13.40...13.60  
4th speed rpm : 750  
Rack travel in m: 12.40...12.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 13.90...14.00

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 310

F21

Rack travel in m: 10.10...10.20  
3rd pressure hPa : 650  
Rack travel in m: 12.40...12.80

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 166.0...172.0  
1000 s: (163.0...175.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 175.0...181.0  
1000 s: (172.0...184.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 82.5...86.5  
1000 s: (80.5...88.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1245...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.80  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3922471

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

Delivery-valve spring pre-tension =  
6.30...6.40 mm.

Permissible alteration from 6.00...6.70  
mm





# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
 Edition : 27.05.94  
 Replaces : 08.93  
 Test oil : ISO-4113

Combination no. : 0 402 736 835

Injection pump  
 Pump designation : PES6P120A12ORS7265  
 EP type number : 0 412 726 882  
 Governor  
 Governor design. :  
 RQV350...900PA964-13  
 K  
 Governor no. : 0 421 815 324

Customer spec. information  
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...110

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
 : (3.90...4.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 14.70...14.80

---

Del. quantity cm<sup>3</sup>/ : 24.2...24.4  
 100 s: (23.9...24.7)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 350.0  
 Rack travel in mm : 6.5...6.7  
 Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
 100 s: (1.8...2.8)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.60...1.80  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 600  
 travel mm : 5.20...5.60  
 4th speed rpm : 1000  
 travel mm : 8.40...8.60  
 5th speed rpm : 1150  
 travel mm : 9.80...10.20

FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 242.0...244.0  
1000 : (239.0...247.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 111...123

##### Testing:

1st rack travel in: 13.30  
Speed rpm : 1060...1090  
2nd rack travel in: 4.00  
Speed rpm : 1210...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...72

##### Testing:

Speed rpm : 275  
Minimum rack travel: 8.10  
Speed rpm : 350  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 650  
Rack travel in m: 13.70...14.10  
3rd speed rpm : 1000  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.70...14.80

#### Measurement

Speed 1/min : 900

1st pressure hPa : -

F24

Rack travel in m: 9.20...9.60  
2nd pressure hPa : 325  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 765  
Rack travel in m: 13.10...13.50

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 219.5...225.5  
1000 s: (216.5...228.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 94.5...98.5  
1000 s: (92.5...100.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1060...1090

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1. # 3922446

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 27.05.94  
Replaces : 16.07.93  
Test oil : ISO-4113

Combination no. : 0 402 736 836

Injection pump  
Pump designation : PES6P120A120RS7265  
EP type number : 0 412 726 882  
Governor  
Governor design. : RQV350...1000PA964  
-14K  
Governor no. : 0 421 815 325

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1000
Rack travel in mm		: 14.50...14.60
Del.quantity cm3/		: 23.6...23.8
	100 s:	(23.3...24.1)
Spread	cm3	: 0.5
	100 s:	(0.9)
2nd speed	rpm	: 350.0
Rack travel in mm		: 6.6...6.8
Del.quantity cm3/		: 2.0...2.6
	100 s:	(1.8...2.8)
Spread	cm3	: 0.8
	100 s:	(1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.80...2.00
2nd speed	rpm	: 450
travel mm		: 3.10...3.50
3rd speed	rpm	: 600
travel mm		: 5.10...5.50
4th speed	rpm	: 1000
travel mm		: 8.10...8.30
5th speed	rpm	: 1200
travel mm		: 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1200

Del.quantity : 236.0...238.0  
1000 : (233.0...241.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1150...1180  
2nd rack travel in: 4.00  
Speed rpm : 1295...1305  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...72

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.10  
Speed rpm : 350  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 13.30...13.70  
3rd speed rpm : 1100  
Rack travel in m: 13.90...14.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.20...9.60  
2nd pressure hPa : 325  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 765

Rack travel in m: 13.20...13.60

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 205.0...211.0  
1000 s: (202.0...214.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 94.5...98.5  
1000 s: (92.5...100.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1150...1180

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3922427

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
 Edition : 4.6.94  
 Replaces : 02.94  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 837  
 Injection pump  
 Pump designation : PES6P120A120RS7265  
 EP type number : 0 412 726 882  
 Governor  
 Governor design. : RQV400...1250PA964  
 -15K  
 Governor no. : 0 421 815 332  
 Customer-spec. information  
 Customer : C.D.C.  
 Engine : 6CTA-A  
 1st version kW : 186.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 2 417 413 086  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 90...110  
 Test nozzle holder  
 assembly : 1 688 901 103  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,7  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24  
 Prestroke mm : 3.95...4.05  
 : (3.90...4.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 13.80...13.90  
 Del.quantity cm3/ : 21.5...21.7  
 100 s: (21.2...22.0)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 350  
 Rack travel in mm : 6.3...6.7  
 Del.quantity cm3/ : 2.2...2.8  
 100 s: (2.0...3.0)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.80...2.00  
 2nd speed rpm : 450  
 travel mm : 3.10...3.50  
 3rd speed rpm : 600  
 travel mm : 5.10...5.50  
 4th speed rpm : 1000  
 travel mm : 8.10...8.30  
 5th speed rpm : 1200  
 travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1200

Del.quantity : 215.5...217.5  
1000 : (212.5...220.5)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...126

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1150...1180  
2nd rack travel in: 4.00  
Speed rpm : 1295...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...74

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.10  
Speed rpm : 350  
Rack travel in mm : 6.30...6.70

CONSTANT REGULATION  
Speed rpm : 325...515

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 650  
Rack travel in m: 13.10...13.50  
3rd speed rpm : 1100  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.20...9.60  
2nd pressure hPa : 325  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 765

Rack travel in m: 13.10...13.50

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 205.0...211.0  
1000 s: (202.0...214.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 94.5...98.5  
1000 s: (92.5...100.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.40  
Speed rpm : 1150...1180

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 180.0...220.0  
1000 s: (175.0...225.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.70  
Del.quantity cm3/ : 22.0...28.0  
1000 s: (20.0...30.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C # 3922449

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 9.6.94  
Replaces : 02.94  
Test oil : ISO-4113

Combination no. : 0 402 736 838

Injection pump  
Pump designation : PES6P120A120RS7275  
EP type number : 0 412 726 886  
Governor  
Governor design. : RQV400...1250PA964  
-16K  
Governor no. : 0 421 815 334

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 119.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 105...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1250
Rack travel in mm		: 13.40...13.50
Del. quantity cm <sup>3</sup> /		: 15.3...15.4
	100 s:	: (14.9...15.7)
Spread	cm <sup>3</sup>	: 0.8
	100 s:	: (1.2)
2nd speed	rpm	: 400
Rack travel in mm		: 6.0...6.4
Del. quantity cm <sup>3</sup> /		: 1.4...2.0
	100 s:	: (1.2...2.2)
Spread	cm <sup>3</sup>	: 0.4
	100 s:	: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 400
travel mm		: 1.40...1.60
2nd speed	rpm	: 500
travel mm		: 2.30...2.70
3rd speed	rpm	: 800
travel mm		: 4.80...5.20
4th speed	rpm	: 1250
travel mm		: 6.90...7.10
5th speed	rpm	: 1500
travel mm		: 8.30...8.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200

Del.quantity : 152.5...154.5  
1000 : (149.5...157.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...122

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1310...1340  
2nd rack travel in: 4.00  
Speed rpm : 1560...1570  
4th rack travel in: 1675  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...77

Testing:  
Speed rpm : 300  
Minimum rack travel: 7.70  
Speed rpm : 400  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 325...519

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 800  
Rack travel in m: 11.60...12.00  
3rd speed rpm : 500  
Rack travel in m: 11.20...11.60  
4th speed rpm : 900  
Rack travel in m: 12.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 265

G02

Rack travel in m: 11.10...11.20  
3rd pressure hPa : 440  
Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm3/ : 130.5...136.5  
1000 s: (127.5...139.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 108.5...112.5  
1000 s: (106.5...114.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1310...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.00...14.00

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 6.00...6.40  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks:  
: C.D.C # 3921918

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 21.01.94  
Test oil : ISO-4113

Combination no. : 0 402 736 839

Injection pump  
Pump designation : PES6P120A12ORS7265  
EP type number : 0 412 726 882  
Governor  
Governor design. : RQV350...1100PA964  
-17K  
Governor no. : 0 421 815 335

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kw : 167.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1100
Rack travel in mm		: 13.20...13.30
Del. quantity cm <sup>3</sup> /		: 19.7...19.9
	100 s:	(19.4...20.2)
Spread	cm <sup>3</sup>	: 0.5
	100 s:	(0.9)
2nd speed	rpm	: 350.0
Rack travel in mm		: 6.2...6.6
Del. quantity cm <sup>3</sup> /		: 2.0...2.6
	100 s:	(1.8...2.8)
Spread	cm <sup>3</sup>	: 0.8
	100 s:	(1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 2.10...2.40
2nd speed	rpm	: 450
travel mm		: 3.20...3.60
3rd speed	rpm	: 900
travel mm		: 5.60...6.00
4th speed	rpm	: 1200
travel mm		: 8.10...8.30
5th speed	rpm	: 1400
travel mm		: 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200

Del.quantity : 197.0...199.0  
1000 : (194.0...202.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...121

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1250...1280  
2nd rack travel in: 4.00  
Speed rpm : 1380...1390  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...76

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.90  
Speed rpm : 350  
Rack travel in mm : 6.20...6.60

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 650  
Rack travel in m: 12.20...12.60  
3rd speed rpm : 1200  
Rack travel in m: 12.90...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 13.20...13.30

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 255  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 520

G05

Rack travel in m: 11.60...12.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 183.5...189.5  
1000 s: (180.5...192.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 85.0...89.0  
1000 s: (83.0...91.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1250...1280

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (190.0...240.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.20...6.60  
Del.quantity cm<sup>3</sup>/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3922424

Start-of-delivery blocking 5,25° after  
start of delivery of cylinder no. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 21.01.94  
Test oil : ISO-4113

Combination no. : 0 402 736 840

Injection pump  
Pump designation : PES6P120A12ORS7265  
EP type number : 0 412 726 882  
Governor  
Governor design. : RQV350...1100PA964  
-18K  
Governor no. : 0 421 815 336

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kw : 157.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1100
Pack travel in mm		: 12.70...12.80
Del. quantity cm3/		: 18.0...18.2
	100 s:	(17.7...18.5)
Spread	cm3	: 0.5
	100 s:	(0.9)
2nd speed	rpm	: 350.0
Rack travel in mm		: 6.4...6.8
Del. quantity cm3/		: 2.0...2.6
	100 s:	(1.8...2.8)
Spread	cm3	: 0.8
	100 s:	(1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 2.10...2.40
2nd speed	rpm	: 450
travel mm		: 3.20...3.60
3rd speed	rpm	: 900
travel mm		: 5.60...6.00
4th speed	rpm	: 1200
travel mm		: 8.10...8.30
5th speed	rpm	: 1400
travel mm		: 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200

Del.quantity : 180.0...182.0  
1000 : (177.0...185.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...122

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1250...1280  
2nd rack travel in: 4.00  
Speed rpm : 1380...1390  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...73

Testing:  
Speed rpm : 275  
Minimum rack trave: 7.90  
Speed rpm : 350  
Rack travel in mm : 6.40...6.80

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 650  
Rack travel in m: 11.70...12.10  
3rd speed rpm : 1200  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 255  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 520

Rack travel in m: 11.50...11.90

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 167.0...173.0  
1000 s: (164.0...176.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1100  
Del.quantity cm3/ : 85.0...89.0  
1000 s: (83.0...91.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1250...1280

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...230.0  
1000 s: (185.0...235.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.80  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3922426

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 02.94  
Test oil : ISO-4113

Combination no. : 0 402 736 841

Injection pump  
Pump designation : PES6P120A120RS7275  
EP type number : 0 412 726 886  
Governor  
Governor design. : RQV400...1250PA964  
-19K  
Governor no. : 0 421 815 342

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kw : 130.5  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 105...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
(3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1250
Rack travel in mm		: 13.40...13.50
Del. quantity cm <sup>3</sup> /		: 15.9...16.1
	100 s:	(15.6...16.4)
Spread	cm <sup>3</sup>	: 0.8
	100 s:	(1.2)
2nd speed	rpm	: 400
Rack travel in mm		: 5.9...6.3
Del. quantity cm <sup>3</sup> /		: 1.4...2.0
	100 s:	(1.2...2.2)
Spread	cm <sup>3</sup>	: 0.4
	100 s:	(0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 400
travel mm		: 1.30...1.50
2nd speed	rpm	: 500
travel mm		: 2.30...2.70
3rd speed	rpm	: 800
travel mm		: 4.80...5.20
4th speed	rpm	: 1250
travel mm		: 6.90...7.10
5th speed	rpm	: 1500
travel mm		: 8.30...8.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200

Del.quantity : 159.5...161.5  
1000 : (156.5...164.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...123

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1300...1330  
2nd rack travel in: 4.00  
Speed rpm : 1560...1570  
4th rack travel in: 1675  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...77

Testing:  
Speed rpm : 300  
Minimum rack travel: 7.40  
Speed rpm : 400  
Rack travel in mm : 5.90...6.30

CONSTANT REGULATION  
Speed rpm : 325...519

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 800  
Rack travel in m: 11.70...11.90  
3rd speed rpm : 500  
Rack travel in m: 11.30...11.70  
4th speed rpm : 900  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 260

Rack travel in m: 11.30...11.40  
3rd pressure hPa : 430  
Rack travel in m: 12.80...13.20

#### START CUT-OUT

Speed 1/min : 250 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm3/ : 135.0...141.0  
1000 s: (132.0...144.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 110.0...114.0  
1000 s: (108.0...116.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1300...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.00...14.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.90...6.30  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks: : C.D.C. # 3921920

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
 Edition : 4.6.94  
 Replaces : 16.07.93  
 Test oil : ISO-4113

Combination no. : 0 402 736 842

Injection pump  
 Pump designation : PES6P120A12ORS7281  
 EP type number : 0 412 726 890  
 Governor  
 Governor design. : RQV400...1250PA1060  
 -1K  
 Governor no. : 0 421 815 344

Customer-spec. information  
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 119.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 105...125

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

---

Rack travel in mm : 13.30...13.40

---

Del. quantity cm3/ : 15.2...15.4

---

100 s: (14.9...15.7)

---

Spread cm3 : 0.8

---

100 s: (1.2)

---

2nd speed rpm : 400.0

Rack travel in mm : 6.0...6.4

Del. quantity cm3/ : 1.5...2.1

100 s: (1.3...2.3)

Spread cm3 : 0.4

100 s: (0.8)

## (B) Setting of injection pump with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
 travel mm : 1.40...1.60

2nd speed rpm : 550  
 travel mm : 2.50...2.90

3rd speed rpm : 800  
 travel mm : 4.00...4.40

4th speed rpm : 1250  
 travel mm : 6.90...7.10

5th speed rpm : 1500  
 travel mm : 9.10...9.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 1200

Del.quantity : 152.5...154.5  
1000 : (149.5...157.5)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...126

#### Testing:

1st rack travel in: 12.30  
Speed rpm : 1310...1340  
2nd rack travel in: 4.00  
Speed rpm : 1475...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 67...79

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.80  
Speed rpm : 400  
Rack travel in mm : 6.00...6.40

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 800  
Rack travel in m: 11.80...12.20  
3rd speed rpm : 500  
Rack travel in m: 11.40...11.80  
4th speed rpm : 900  
Rack travel in m: 12.20...12.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.40

#### Measurement

Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 265

Rack travel in m: 11.10...11.20  
3rd pressure hPa : 440  
Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 127.5...133.5  
1000 s: (124.5...136.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm<sup>3</sup>/ : 108.5...112.5  
1000 s: (106.5...114.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1310...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.00...14.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.00...6.40  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000 s: (13.0...23.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3925085

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 16.08.93  
Test oil : ISO-4113

Combination no. : 0 402 736 843

Injection pump  
Pump designation : PES6P120A120RS7281  
EP type number : 0 412 726 890  
Governor  
Governor design. :  
RQV400...1250PA1060K  
Governor no. : 0 421 815 343

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 130.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 105...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x3.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1250
Rack travel in mm		: 13.50...13.60
Del.quantity cm <sup>3</sup> /		: 15.5...15.7
	100 s:	(15.2...16.0)
Spread	cm <sup>3</sup>	: 0.8
	100 s:	(1.2)
2nd speed	rpm	: 400.0
Rack travel in mm		: 6.1...6.5
Del.quantity cm <sup>3</sup> /		: 1.4...2.0
	100 s:	(1.2...2.2)
Spread	cm <sup>3</sup>	: 0.4
	100 s:	(0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 400
travel mm		: 1.40...1.60
2nd speed	rpm	: 550
travel mm		: 2.50...2.90
3rd speed	rpm	: 800
travel mm		: 4.00...4.40
4th speed	rpm	: 1250
travel mm		: 6.90...7.10
5th speed	rpm	: 1500
travel mm		: 9.10...9.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200

Del.quantity : 155.5...157.5  
1000 : (152.5...160.5)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...123

Testing:  
1st rack travel in: 12.50  
Speed rpm : 1305...1335  
2nd rack travel in: 4.00  
Speed rpm : 1470...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...78

Testing:  
Speed rpm : 300  
Minimum rack travel: 7.70  
Speed rpm : 400  
Rack travel in mm : 6.10...6.50

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 800  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 500  
Rack travel in m: 11.20...11.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.50...13.60

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.40...10.80  
2nd pressure hPa : 260  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 430

Rack travel in m: 13.00...13.40

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 124.0...130.0  
1000 s: (121.5...132.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 109.5...113.5  
1000 s: (107.5...115.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1305...1335

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.00...14.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.50  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks:  
: C.D.C. # 3925086

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 02.94  
Test oil : ISO-4113

Combination no. : 0 402 736 844

Injection pump  
Pump designation : PES6P12UA120RS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. : RQV400...1250PA964  
-21K  
Governor no. : 0 421 815 354

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 14.80...14.90  
Del. quantity cm<sup>3</sup>/ : 19.3...219.5  
100 s: (19.0...19.8)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)  
2nd speed rpm : 400.0  
Rack travel in mm : 6.4...6.8  
Del. quantity cm<sup>3</sup>/ : 2.0...2.6  
100 s: (1.8...2.8)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.40...1.60  
2nd speed rpm : 550  
travel mm : 3.10...3.50  
3rd speed rpm : 800  
travel mm : 4.30...4.70  
4th speed rpm : 1250  
travel mm : 7.00...7.20  
5th speed rpm : 1500  
travel mm : 9.20...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1475  
Rack travel in mm : 9.00...12.00

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1150  
Aneroid pressure h: 1200  
Del.quantity : 193.5...195.5  
1000 : (190.5...198.5)  
Spread cm3 : 8.00  
1000 : (12.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 114.0...126.0

### Testing:

1st rack travel in: 13.40  
Speed rpm : 1300...1330  
2nd rack travel in: 4.00  
Speed rpm : 1480...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 67...79

### Testing:

Speed rpm : 300  
Minimum rack travel: 9.00  
Speed rpm : 400  
Rack travel in mm : 6.40...6.80

### CONSTANT REGULATION

Speed rpm : 350...500

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 800  
Rack travel in m: 13.80...14.20  
3rd speed rpm : 1250  
Rack travel in m: 14.40...14.60  
4th speed rpm : 900  
Rack travel in m: 14.00...14.40

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

## Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 355  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 645  
Rack travel in m: 13.30...13.70

## START CUT-OUT

Speed 1/min : 315 (325)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 900  
Del.quantity cm3/ : 179.0...185.0  
1000 s: (176.0...188.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm3/ : 94.5...98.5  
1000 s: (92.5...100.5)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1300...1330

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

## LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.40...6.80  
Del.quantity cm3/ : 18.0...26.0  
1000 s: (18.0...28.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

## Remarks:

: C.D.C. # 3921925

Delivery-valve spring pre-tension =  
6.30...6.40 mm.

Permissible alteration from 6.00...6.70

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : —  
Test oil : ISO-4113

Combination no. : 0 402 736 845

Injection pump  
Pump designation : PES6P120A120RS7286  
EP type number : 0 412 726 894  
Governor  
Governor design. : RQV350...1110PA964  
-20K  
Governor no. : 0 421 815 352

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 224.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 95...115

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X3.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values —

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 15.20...15.30  
Del. quantity cm<sup>3</sup>/ : 24.0...24.2  
100 s: (23.7...24.5)

Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

2nd speed rpm : 350.0  
Rack travel in mm : 6.4...6.8  
Del. quantity cm<sup>3</sup>/ : 2.1...2.7  
100 s: (1.9...2.9)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 2.10...2.40  
2nd speed rpm : 450  
travel mm : 3.20...3.60  
3rd speed rpm : 900  
travel mm : 5.60...6.00  
4th speed rpm : 1200  
travel mm : 8.10...8.30  
5th speed rpm : 1400  
travel mm : 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200

Del.quantity : 240.0...242.0  
1000 : (237.0...245.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113.0...125.0

#### Testing:

1st rack travel in: 13.60  
Speed rpm : 1240...1270  
2nd rack travel in: 4.00  
Speed rpm : 1395...1405  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 65...79

#### Testing:

Speed rpm : 275  
Minimum rack travel: 8.30  
Speed rpm : 350  
Rack travel in mm : 6.40...6.80

#### CONSTANT REGULATION

Speed rpm : 330...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 15.20...15.30  
2nd speed rpm : 750  
Rack travel in m: 13.50...13.90  
3rd speed rpm : 1200  
Rack travel in m: 14.60...14.80  
4th speed rpm : 650  
Rack travel in m: 13.20...13.60

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.30

#### Measurement

Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 9.00...9.40  
2nd pressure hPa : 335

G20

Rack travel in m: 10.90...11.00  
3rd pressure hPa : 715  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 205.0...211.0  
1000 s: (202.0...214.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...81.0  
1000 s: (75.0...83.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.60  
Speed rpm : 1240...1270

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (155.0...205.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.80  
Del.quantity cm3/ : 21.0...27.0  
1000 s: (19.0...29.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3922425

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 02.94  
Test oil : ISO-4113

Combination no. : 0 402 736 846

Injection pump  
Pump designation : PES6P120A120RS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. :  
RQV400...1250PA1081K  
Governor no. : 0 421 815 360

Customer spec. information  
Customer : C.D.C

Engine : 6BTA-A

1st version kW : 156.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 17.5...17.7  
100 s: (17.2...18.0)

Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

2nd speed rpm : 420  
Rack travel in mm : 5.1...5.5  
Del. quantity cm<sup>3</sup>/ : 1.4...2.0  
100 s: (1.2...2.2)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
travel mm : 1.40...1.60  
2nd speed rpm : 550  
travel mm : 3.10...3.50  
3rd speed rpm : 800  
travel mm : 4.30...4.70  
4th speed rpm : 1250  
travel mm : 7.00...7.20  
5th speed rpm : 1500  
travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1200  
Del. quantity : 175.0...177.0  
1000 : (172.0...180.0)



Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1295...1325  
2nd rack travel in: 4.00  
Speed rpm : 1470...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...78

Testing:  
Speed rpm : 300  
Minimum rack travel: 8.90  
Speed rpm : 420  
Rack travel in mm : 5.10...5.50

CONSTANT REGULATION  
Speed rpm : 345...495

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 800  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 500  
Rack travel in m: 10.70...11.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1200  
Rack travel mm : 13.90...14.00

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 9.60...10.00  
2nd pressure hPa : 305  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 585  
Rack travel in m: 12.70...13.10

#### START CUT-OUT

Speed 1/min : 315 (325)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 127.0...133.0  
1000 s: (124.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 93.0...97.0  
1000 s: (91.0...99.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 1295...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 420  
Rack travel in mm : 5.10...5.50  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm3 : 4.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3924903  
Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : 02.94  
Test oil : ISO-4113

Combination no. : 0 402 736 847

Injection pump  
Pump designation : PES6P120A120RS7287  
EP type number : 0 412 726 896  
Governor  
Governor design. : RQV400...1250PA964  
-22K  
Governor no. : 0 421 815 366

Customer-spec. information  
Customer : C.D.C.

Engine : 6BTA-A

1st version kw : 156.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 10.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del.quantity cm<sup>3</sup>/ : 17.7...17.9

100 s: (17.4...18.2)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 400

Rack travel in mm : 6.0...6.4

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.4...2.4)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.40...1.60

2nd speed rpm : 550

travel mm : 3.10...3.50

3rd speed rpm : 800

travel mm : 4.30...4.70

4th speed rpm : 1250

travel mm : 7.00...7.20

5th speed rpm : 1500

travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del.quantity : 177.0...179.0  
1000 : (174.0...182.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 13.10  
Speed rpm : 1300...1330  
2nd rack travel in: 4.00  
Speed rpm : 1475...1485  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...78

Testing:  
Speed rpm : 300  
Minimum rack travel: 8.80  
Speed rpm : 400  
Rack travel in mm : 6.00...6.40

CONSTANT REGULATION  
Speed rpm : 345...495

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 800  
Rack travel in m: 13.10...13.50  
3rd speed rpm : 1250  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.30...14.40

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 10.40...10.80  
2nd pressure hPa : 425  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 685

G25

Rack travel in m: 13.20...13.60

#### START CUT-OUT

Speed 1/min : 315 (325)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 159.0...165.0  
1000 s: (156.0...168.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm3/ : 99.0...103.0  
1000 s: (97.0...105.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.10  
Speed rpm : 1300...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.00...6.40  
Del.quantity cm3/ : 16.5...22.5  
1000 s: (14.5...24.5)  
Spread cm3 : 4.00  
1000 s: (8.00)

Remarks: : C.D.C. # 3921923

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery blocking 6,25° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
 Edition : 4.6.94  
 Replaces : 02.94  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 848  
 Injection pump  
 Pump designation : PES6P120A12ORS7314  
 EP type number : 0 412 726 901  
 Governor  
 Governor design. : RQV400...1250PA964  
 -24K  
 Governor no. : 0 421 815 374

Customer-spec. information  
 Customer : CDC

Engine : 6BTA-A

1st version kW : 142.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...110

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
 : (3.50...3.70)  
 Rack travel in mm : 10.00...13.00  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 16.5...16.7  
 100 s: (16.2...17.0)

Spread cm3 : 0.8  
 100 s: (1.2)

2nd speed rpm : 420  
 Rack travel in mm : 5.6...6.0  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.8...1.8)  
 Spread cm3 : 0.4  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 400  
 travel mm : 1.40...1.60  
 2nd speed rpm : 550  
 travel mm : 3.10...3.50  
 3rd speed rpm : 800  
 travel mm : 4.30...4.70  
 4th speed rpm : 1250  
 travel mm : 7.00...7.20  
 5th speed rpm : 1500  
 travel mm : 9.20...9.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 1200

Del.quantity : 165.5...167.5  
1000 : (162.5...170.5)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

#### Testing:

1st rack travel in: 12.80  
Speed rpm : 1295...1325  
2nd rack travel in: 4.00  
Speed rpm : 1465...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 66...78

#### Testing:

Speed rpm : 300  
Minimum rack travel: 9.80  
Speed rpm : 420  
Rack travel in mm : 5.60...6.00

#### CONSTANT REGULATION

Speed rpm : 345...495

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 800  
Rack travel in m: 13.00...13.40  
3rd speed rpm : 1250  
Rack travel in m: 13.80...14.00

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 1150  
Pressure hPa : 1200  
Rack travel mm : 14.20...14.30

##### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 11.10...11.50  
2nd pressure hPa : 375  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 500

G27

Rack travel in m: 13.10...13.50

#### START CUT-OUT

Speed 1/min : 315 (325)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 144.0...150.0  
1000 s: (141.0...153.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1150  
Del.quantity cm<sup>3</sup>/ : 106.5...110.5  
1000 s: (104.5...112.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1295...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 13.50...14.50

#### LOW IDLE

Speed rpm : 420  
Rack travel in mm : 5.60...6.00  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (8.0...18.0)  
Spread cm<sup>3</sup> : 4.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3921922

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery blocking 5,75° after  
start of delivery of cylinder no. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 11.6.94  
Replaces : -  
Test oil : ISC-4113

Combination no. : 0 402 736 849

Injection pump  
Pump designation :  
PES6P120A720/3LS7251  
EP type number : 0 412 726 860  
Governor  
Governor design. : RQV300...1000PA962  
-12K  
Governor no. : 0 421 815 407

Customer-spec. information  
Customer : MAN

Engine : D2866LF09

1st version kW : 398.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

G28

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90  
: (4.75...4.95)  
Rack travel in mm : 15.00...16.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del. quantity cm3/ : 29.3...29.5

100 s: (29.0...29.8)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 300

Rack travel in mm : 5.0...5.4

Del. quantity cm3/ : 2.9...3.5

100 s: (2.6...3.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.29...1.79

2nd speed rpm : 374  
travel mm : 2.31...2.81

3rd speed rpm : 480  
travel mm : 3.40...3.90

4th speed rpm : 769  
travel mm : 6.70...7.20

5th speed rpm : 1060  
travel mm : 10.14...10.64

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1120

Rack travel in mm : 10.50...14.50

FULL LOAD DELIV. AT FULL LOAD STOP

#### 1st version

Speed rpm : 900  
Aneroid pressure h: 1300  
Del.quantity : 293.0...295.0  
1000 : (290.0...298.0)  
Spread cm3 : 10.00  
1000 : (14.00)

#### RATED SPEED

#### 1st version

Control lever  
position degrees: 296...304

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 248...256

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.70  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

#### CONSTANT REGULATION

Speed rpm : 270...390

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 1000  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 750  
Rack travel in m: 13.30...13.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 900  
Pressure hPa : 1300  
Rack travel mm : 13.90...14.00

#### Measurement

Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 9.00...9.20

H01

2nd pressure hPa : 220  
Rack travel in m: 9.40...9.5080  
3rd pressure hPa : 720  
Rack travel in m: 11.70...12.10

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 1000  
Del.quantity cm3/ : 266.0...272.0  
1000 s: (263.0...275.0)  
Aneroid pressure h: 1300  
Speed rpm : 750  
Del.quantity cm3/ : 284.0...290.0  
1000 s: (281.0...293.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 168.0...171.0  
1000 s: (165.0...173.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...225.0  
1000 s: (191.0...229.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 29.0...35.0  
1000 s: (26.0...38.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 3-7373

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 736 851  
Injection pump  
Pump designation : PES6P120A12ORS7332  
EP type number : 0 412 726 909  
Governor  
Governor design. : RQV350...1000PA964  
-24K  
Governor no. : 0 421 815 411

Customer-spec. information  
Customer : CDC

Engine : 6CTA-A

1st version kW : 205.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 90...110

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 15.10...15.20  
Del.quantity cm3/ : 23.4...23.6  
100 s: (23.1...23.9)  
Spread cm3 : 0.8  
100 s: (1.2)  
2nd speed rpm : 350  
Rack travel in mm : 6.7...6.9  
Del.quantity cm3/ : 2.4...3.0  
100 s: (2.2...3.2)  
Spread cm3 : 0.4  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00  
2nd speed rpm : 450  
travel mm : 3.10...3.50  
3rd speed rpm : 600  
travel mm : 5.10...5.50  
4th speed rpm : 1000  
travel mm : 8.10...8.30  
5th speed rpm : 1200  
travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1200



Del.quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 13.50  
Speed rpm : 1140...1170  
2nd rack travel in: 4.00  
Speed rpm : 1295...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...75

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.20  
Speed rpm : 350  
Rack travel in mm : 6.70...6.90

CONSTANT REGULATION  
Speed rpm : 335...515

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 650  
Rack travel in m: 13.50...13.90  
3rd speed rpm : 1100  
Rack travel in m: 14.50...14.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 15.10...15.20

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 825

HO

Rack travel in m: 13.30...13.70

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 207.5...213.5  
1000 s: (204.5...216.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 94.0...98.0  
1000 s: (92.0...100.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1140...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (155.0...205.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 24.0...30.0  
1000 s: (22.0...32.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3927924

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
 Edition : 4.6.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 852  
 Injection pump  
 Pump designation : PES6P120A120RS7332  
 EP type number : 0 412 726 909  
 Governor  
 Governor design. : RQV350...900PA964  
 -25K  
 Governor no. : 0 421 815 418

Customer-spec. information  
 Customer : CDC

Engine : 6CTA-A

1st version kW : 205.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 086

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 90...110

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
 : (3.90...4.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50(0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm3/ : 23.8...24.0

100 s: (23.5...24.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.60...1.80

2nd speed rpm : 450  
 travel mm : 3.00...3.40

3rd speed rpm : 600  
 travel mm : 5.20...5.60

4th speed rpm : 1000  
 travel mm : 8.40...8.60

5th speed rpm : 1150  
 travel mm : 9.80...10.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200

Del.quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...125

Testing:  
1st rack travel in: 13.90  
Speed rpm : 1055...1085  
2nd rack travel in: 4.00  
Speed rpm : 1215...1225  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...75

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.10  
Speed rpm : 350  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 335...515

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.20...15.30  
2nd speed rpm : 650  
Rack travel in m: 14.00...14.40  
3rd speed rpm : 1000  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 370  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 825

H05

Rack travel in m: 13.20...13.60

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 221.0...227.0  
1000 s: (218.0...230.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1000  
Del.quantity cm3/ : 94.0...98.0  
1000 s: (92.0...100.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 1055...1085

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (155.0...205.0)  
Rack travel in mm : 10.60...11.60

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.60...6.80  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (21.0...31.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3927923

Delivery-valve spring pre-tension =  
6.30...6.40 mm.  
Permissible alteration from 6.00...6.70  
mm

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 11.6.94  
Replaces : 04.94  
Test oil : ISO-4113

Combination no. : 0 402 746 919

Injection pump  
Pump designation : PES6P120A720LS7237  
-11  
EP type number : 0 412 726 911  
Governor  
Governor design. : RQ300/1100PA1013-4  
Governor no. : 0 421 801 711

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5-  
3

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.75...13.85

Del.quantity cm3/ : 20.3...20.5

100 s : (20.0...20.8)

Spread cm3 : 0.5

100 s : (0.9)

2nd speed rpm : 300  
Rack travel in mm : 5.60...6.20  
Del.quantity cm3/ : 1.6...2.2  
100 s : (1.3...2.5)  
Spread cm3 : 0.8  
100 s : (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1400  
Del.quantity : 203.0...205.0  
1000 : (200.0...208.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 1145...1161  
2nd rack travel in: 4.00  
Speed rpm : 1245...1275  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 355...395

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 600  
Rack travel mm : 12.65...12.75

Measurement

Speed 1/min : 500

1st pressure hPa : 950  
Rack travel in m: 13.35...13.55  
2nd pressure hPa : -  
Rack travel in m: 11.90...12.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 207.0...211.0  
1000 s: (204.0...214.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

H07

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1145...1161

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 968  
  
Injection pump  
Pump designation : PES6P120A720RS7321  
EP type number : 0 412 726 906  
Governor  
Governor design. : RQV325...975PA944  
-16K  
Governor no. : 0 421 815 390

Customer-spec. information  
Customer : MACK

Engine : E7-250A

1st version kW : 180.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

H08

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 26.9...27.1

100 s: (26.6...27.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200

travel mm : 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200

Del.quantity : 269.5...271.5

1000 : (266.5...274.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 103...115

Testing:

1st rack travel in: 11.90

Speed rpm : 1015...1025

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 56...68

Testing:

Speed rpm : 275

Minimum rack travel: 6.00

Speed rpm : 340

Rack travel in mm : 4.70...5.10

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : ?

torque control curve - 1st version

1st speed rpm : 975

Rack travel in m: 12.90...13.00

2nd speed rpm : 600

Rack travel in m: 12.50...12.70

3rd speed rpm : 500

Rack travel in m: 11.60...12.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 975

Pressure hPa : 1200

Rack travel mm : 12.90...13.00

Measurement

Speed 1/min : 975

1st pressure hPa : -

Rack travel in m: 8.90...9.30

2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

3rd pressure hPa : 590

Rack travel in m: 11.50...11.90

START CUT-OUT

Speed 1/min : 250 (255)

HD9

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 600

Del.quantity cm3/ : 302.0...308.0

1000 s: (299.0...311.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 189.0...193.0

1000 s: (187.0...195.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 1015...1025

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.70...5.10

Del.quantity cm3/ : 37.0...43.0

1000 s: (35.0...45.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5212-P6

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 969  
  
Injection pump  
Pump designation : PES6P120A720RS7321  
EP type number : 0 412 726 906  
Governor  
Governor design. : RQV325...875PA944  
-17K  
Governor no. : 0 421 815 391

Customer-spec. information  
Customer : MACK

Engine : EM7-250

1st version kW : 187.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

H10

Prestroke mm : 3.25...3.35  
(3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 26.8...27.0

100 s: (26.5...27.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60

2nd speed rpm : 450  
travel mm : 3.30...3.70

3rd speed rpm : 700  
travel mm : 7.90...8.10

4th speed rpm : 900  
travel mm : 9.40...9.60

5th speed rpm : 1050  
travel mm : 10.60...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1200  
Del.quantity : 268.5...270.5  
1000 : (265.5...273.5)



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 11.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 510  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 400  
Rack travel in m: 12.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 285  
Rack travel in m: 9.90...10.00  
3rd pressure hPa : 570  
Rack travel in m: 12.10...12.50

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 342.0...348.0  
1000 s: (339.0...351.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 181.0...185.0  
1000 s: (179.0...187.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5212-P2

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 970

Injection pump  
Pump designation : PES6P120A720RS7321  
EP type number : 0 412 726 906  
Governor  
Governor design. : RQV325...875PA944  
-17K  
Governor no. : 0 421 815 392

Customer-spec. information  
Customer : MACK

Engine : EM7-275

1st version kW : 202.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 13.40...13.50

Del. quantity cm<sup>3</sup>/ : 29.2...29.4  
100 s: (28.9...29.7)

Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 340.0  
Rack travel in mm : 4.8...5.0  
Del. quantity cm<sup>3</sup>/ : 3.7...4.3  
100 s: (3.5...4.5)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 3.30...3.70  
3rd speed rpm : 700  
travel mm : 7.90...8.30  
4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity : 292.5...294.5  
1000 : (289.5...297.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

Testing:  
1st rack travel in: 12.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 59...71

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 330...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 600  
Rack travel in m: 14.20...14.40  
4th speed rpm : 450  
Rack travel in m: 13.20...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 310  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 635

H13

Rack travel in m: 12.50...12.90

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 381.0...387.0  
1000 s: (378.0...390.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 183.0...187.0  
1000 s: (181.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5212-P4

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 971

Injection pump  
Pump designation : PES6P120A/20RS7321  
EP type number : 0 412 726 906  
Governor  
Governor design. : RQV325...975PA944  
-19K  
Governor no. : 0 421 815 393

Customer-spec. information  
Customer : MACK

Engine : E7-300A

1st version kW : 224.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 27.4...27.6

100 s : (27.1...27.9)

Spread cm<sup>3</sup> : 0.5

100 s : (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.7...5.1

Del. quantity cm<sup>3</sup>/ : 2.8...3.4

100 s : (2.6...3.6)

Spread cm<sup>3</sup> : 0.8

100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60

2nd speed rpm : 450  
travel mm : 2.70...3.30

3rd speed rpm : 950  
travel mm : 7.90...8.10

4th speed rpm : 1200  
travel mm : 10.20...10.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 975  
Aneroid pressure h : 1200  
Del. quantity : 274.5...276.5  
1000 : (271.5...279.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 110...122

Testing:

1st rack travel in: 12.00

Speed rpm : 1015...1025

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 56...68

Testing:

Speed rpm : 275

Minimum rack travel: 6.00

Speed rpm : 340

Rack travel in mm : 4.70...5.10

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 975

Rack travel in m: 13.00...13.10

2nd speed rpm : 600

Rack travel in m: 12.20...12.40

3rd speed rpm : 500

Rack travel in m: 11.20...11.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 975

Pressure hPa : 1200

Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 975

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 325

Rack travel in m: 9.40...9.50

3rd pressure hPa : 640

Rack travel in m: 11.70...12.10

START CUT-OUT

Speed 1/min : 250 (255)

H15

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 600

Del.quantity cm3/ : 285.5...291.5

1000 s: (282.5...294.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 169.0...173.0

1000 s: (167.0...175.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 1015...1025

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

## LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.70...5.10

Del.quantity cm3/ : 28.5...34.5

1000 s: (26.5...36.5)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5212-P8

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
Edition : 4.6.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 972  
  
Injection pump  
Pump designation : PES6P120A72ORS7321  
EP type number : 0 412 726 906  
Governor  
Governor design. : RQV325...875PA944  
-20K  
Governor no. : 0 421 815 394

Customer-spec. information  
Customer : MACK

Engine : EM7-300

1st version kW : 224.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875  

---

Rack travel in mm : 14.00...14.10  

---

Del. quantity cm<sup>3</sup>/ : 30.6...30.8  
100 s : (30.3...31.1)  

---

Spread cm<sup>3</sup> : 0.5  
100 s : (0.9)

2nd speed rpm : 340.0  
Rack travel in mm : 4.7...4.9  
Del. quantity cm<sup>3</sup>/ : 3.7...4.3  
100 s : (3.5...4.5)  
Spread cm<sup>3</sup> : 0.8  
100 s : (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 3.30...3.70  
3rd speed rpm : 700  
travel mm : 7.90...8.30  
4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity : 306.5...308.5  
1000 : (303.5...311.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...124

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 59...71

#### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.70...4.90

#### CONSTANT REGULATION

Speed rpm : 330...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 510  
Rack travel in m: 14.60...14.80  
3rd speed rpm : 575  
Rack travel in m: 14.60...14.80  
4th speed rpm : 450  
Rack travel in m: 13.90...14.30

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.60...14.80

#### Measurement

Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 370  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 760

H17

Rack travel in m: 13.30...13.70

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 396.0...401.0  
1000 s: (392.0...404.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 185.5...189.5  
1000 s: (183.5...191.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MACK #  
313GC5212-P10

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC  
 Edition : 6.6.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 973  
 Injection pump  
 Pump designation : PES6P120A720RS7321  
 EP type number : 0 412 726 906  
 Governor  
 Governor design. : RQV325...900PA944  
 -21K  
 Governor no. : 0 421 815 395

Customer-spec. information  
 Customer : MACK

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 084

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 103

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 33.5...33.7

100 s: (33.2...34.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...5.0

Del.quantity cm3/ : 2.8...3.4

100 s: (2.6...3.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 700  
 travel mm : 6.00...6.40

4th speed rpm : 900  
 travel mm : 8.50...8.70

5th speed rpm : 1050  
 travel mm : 9.80...10.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 335.5...337.5  
 1000 : (332.5...340.5)



Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...122

Testing:  
1st rack travel in: 13.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...70

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...5.00

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 675  
Rack travel in m: 13.70...14.10  
4th speed rpm : 500  
Rack travel in m: 11.90...12.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 400  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 775

Rack travel in m: 12.60...13.00

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 351.0...357.0  
1000 s: (348.0...360.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 169.0...173.0  
1000 s: (167.0...173.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.60...5.00  
Del.quantity cm3/ : 28.5...34.5  
1000 s: (26.5...36.5)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK #  
313GC5212-P12

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : NAV  
Edition : 6.6.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 983

Injection pump  
Pump designation : PES6P120A32URS7328  
EP type number : 0 412 726 908  
Governor  
Governor design. :  
RQV350...1250PA1137K  
Governor no. : 0 421 815 405

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-408

1st version kW : 157.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 076

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

H2O

Prestroke mm : 2.85...2.95  
(2.80...3.00)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed	rpm	: 1250
Rack travel in mm		: 12.70...12.80
Del. quantity cm <sup>3</sup> /		: 16.0...16.2
	100 s:	(15.7...16.5)
Spread	cm <sup>3</sup>	: 0.5
	100 s:	(0.9)

2nd speed	rpm	: 350.0
Rack travel in mm		: 5.7...5.9
Del. quantity cm <sup>3</sup> /		: 1.2...1.8
	100 s:	(1.0...2.0)
Spread	cm <sup>3</sup>	: 0.5
	100 s:	(0.9)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.90...2.10
2nd speed	rpm	: 500
travel mm		: 4.10...4.50
3rd speed	rpm	: 850
travel mm		: 7.00...7.40
4th speed	rpm	: 1250
travel mm		: 9.50...9.70
5th speed	rpm	: 1450
travel mm		: 11.00...11.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version		
Speed	rpm	: 1250
Aneroid pressure h:		1500
Del. quantity		: 160.5...162.5
	1000	: (157.5...165.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...128

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1295...1325  
2nd rack travel in: 4.00  
Speed rpm : 1450...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...86

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 850  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 650  
Rack travel in m: 11.30...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1500  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 10.00...10.40  
2nd pressure hPa : 290  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 710  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 850  
Del.quantity cm3/ : 152.0...158.0  
1000 s: (149.0...161.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm3/ : 102.0...106.0  
1000 s: (100.0...108.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1295...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...150.0  
1000 s: (100.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 12.5...18.5  
1000 s: (10.5...20.5)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: NAVISTAR  
#1823107C91

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
Edition : 07.06.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 236 005

Injection pump  
Pump designation :  
PES6MW100/320/3RS151

8-1  
EP type number : 0 413 206 018  
Governor  
Governor design. :  
RQV325...1300MW133-1

K  
Governor no. : 0 420 083 984

Customer-spec. information  
Customer : PER

Engine : 180 TI

1st version kW : 134.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

H22

Prestroke mm : 4.95...5.05  
Rack travel in mm : 12.0...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.6...14.7

Del.quantity cm<sup>3</sup>/ : 14.0...14.2

100 s: (13.7...14.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.85...2.75)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.45...1.95

2nd speed rpm : 361  
travel mm : 2.09...2.59

3rd speed rpm : 500  
travel mm : 3.67...4.17

4th speed rpm : 881  
travel mm : 6.21...6.71

5th speed rpm : 1355  
travel mm : 9.98...10.48

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del. quantity : 140.0...142.0  
1000 : (137.0...145.0)  
Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 13.6  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1600  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.8

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.0  
Speed rpm : 325  
Rack travel in mm : 5.7...5.9

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 14.6...14.7  
2nd speed rpm : 800  
Rack travel in m: 13.25...13.45  
3rd speed rpm : 500  
Rack travel in m: 11.35...11.55  
4th speed rpm : 1000  
Rack travel in m: 14.1...14.4  
5th speed rpm : 700  
Rack travel in m: 12.55...12.85

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : 900  
Rack travel mm : 14.3...14.4

#### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 9.1...9.3

H23

2nd pressure hPa : 250  
Rack travel in m: 10.25...10.35  
3rd pressure hPa : 400  
Rack travel in m: 13.05...13.35

#### START CUT-OUT

Speed 1/min : 240 (270)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del. quantity cm3/ : 138.0...142.0  
1000 s: (135.0...145.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 900  
Speed rpm : 500  
Del. quantity cm3/ : 116.0...120.0  
1000 s: (113.0...123.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 68.0...70.0  
1000 s: (66.0...72.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.6  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 78.0...92.0  
1000 s: (75.0...95.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.7...5.9  
Del. quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 04.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 244 033

Injection pump  
Pump designation :  
PES4MW100/720RS1519-

EP type number : 0 413 204 017  
Governor  
Governor design. :  
RQV300...1300MW132-1  
Governor no. : 0 420 083 292

Cust. part no. : 0240748202

Customer-spec. information  
Customer : MB

Engine : OM364LA

1st version kw : 103.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness : 8.00X2.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.85...13.95

Del.quantity cm<sup>3</sup>/ : 12.5...12.7

100 s: (12.2...13.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.8...4.0

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.75...1.65)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.66...1.16

2nd speed rpm : 629  
travel mm : 2.9...3.4

3rd speed rpm : 820  
travel mm : 3.84...4.34

4th speed rpm : 1150  
travel mm : 5.7...6.2

5th speed rpm : 1354  
travel mm : 7.52...8.02

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1400

Del.quantity : 125.0...127.0  
1000 : (122.0...130.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 12.9  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 67...75

#### Testing:

Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.8...4.0

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1400  
Rack travel mm : 13.85...13.95

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.0...11.2  
2nd pressure hPa : 350  
Rack travel in m: 11.5...11.7  
3rd pressure hPa : 600  
Rack travel in m: 13.0...13.2

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1400  
Speed rpm : 750

Del.quantity cm3/ : 122.0...126.0  
1000 s: (119.0...129.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm3/ : 124.0...128.0  
1000 s: (121.0...131.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 66.0...68.0  
1000 s: (64.0...70.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...145.0  
1000 s: (137.0...148.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 07.06.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 246 031

Injection pump  
Pump designation :  
PES6MW100/720RS1515-

1  
EP type number : 0 413 206 021  
Governor  
Governor design. :  
RQV300...1300MW125-4  
Governor no. : 0 420 083 284

Cust. part no. : 0220745902

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 127.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H26

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 3.45...3.75  
Del.quantity cm3/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.15...1.65  
2nd speed rpm : 363  
travel mm : 1.8...2.3  
3rd speed rpm : 500  
travel mm : 2.74...3.24  
4th speed rpm : 1354  
travel mm : 8.43...8.93

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1000  
Del.quantity : 99.0...101.0  
1000 : (97.0...103.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED



1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.2  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 3.6

Testing:  
Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.45...3.75

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.2...11.3  
2nd speed rpm : 750  
Rack travel in m: 11.15...11.35

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.2...11.3

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.0...8.2  
2nd pressure hPa : 300  
Rack travel in m: 8.7...8.9  
3rd pressure hPa : 500  
Rack travel in m: 10.1...10.3

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 90.5...93.5  
1000 s: (88.0...96.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 43.0...45.0  
1000 s: (41.0...47.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.2  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (122.0...148.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.45...3.75  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 09.06.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 246 032

Injection pump  
Pump designation :  
PES6MM100/720RS1515-

EP type number : 0 413 206 021  
Governor  
Governor design. :  
RQV300...1300MM125-5  
Governor no. : 0 420 083 285

Cust. part no. : 0220746002

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 142.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H28

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed	rpm	: 1300
Rack travel in mm		: 12.30...12.40
Del.quantity cm3/		: 11.0...11.2
	100 s:	(10.8...11.4)
Spread	cm3	: 0.4
	100 s:	(0.6)
2nd speed	rpm	: 300.0
Rack travel in mm		: 3.7...3.9
Del.quantity cm3/		: 1.0...1.4
	100 s:	(0.7...1.6)
Spread	cm3	: 0.3
	100 s:	(0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
travel mm		: 1.2...1.6
2nd speed	rpm	: 500
travel mm		: 2.7...3.3
3rd speed	rpm	: 880
travel mm		: 4.9...5.1
4th speed	rpm	: 1350
travel mm		: 8.6...9.0

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version		
Speed	rpm	: 1300
Aneroid pressure h:		1100
Del.quantity		: 110.0...112.0
	1000	: (108.0...114.0)
Spread	cm3	: 3.50
	1000	: (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.3  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 3.8

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.7...3.9

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 12.3...12.4  
2nd speed rpm : 750  
Rack travel in m: 12.25...12.45

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1100  
Rack travel mm : 12.3...12.4

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.35...8.55  
2nd pressure hPa : 250  
Rack travel in m: 9.1...9.3  
3rd pressure hPa : 500  
Rack travel in m: 10.8...11.0

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm3/ : 105.0...108.0  
1000 s: (102.5...110.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 43.0...45.0  
1000 s: (41.0...47.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.3  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.7...3.9  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 15.04.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 246 035

Injection pump  
Pump designation :  
PES6MW100/720RS1517-

EP type number : 0 413 206 020  
Governor  
Governor design. :  
RQV300...1300MW132-2  
Governor no. : 0 420 083 293

Cust. part no. : 0240744202

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 125.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.95...12.05

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0  
Rack travel in mm : 3.7...3.9  
Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.77...1.27  
2nd speed rpm : 490  
travel mm : 2.0...2.5  
3rd speed rpm : 710  
travel mm : 2.78...3.28  
4th speed rpm : 1100  
travel mm : 4.51...5.01  
5th speed rpm : 1353  
travel mm : 6.45...6.95

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1000  
Del.quantity : 101.0...103.0  
1000 : (99.0...105.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 11.0  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 300

Testing:  
Speed rpm : 200  
Minimum rack travel: 4.50  
Speed rpm : 300  
Rack travel in mm : 3.7...3.9

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.95...12.05

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.7...9.9  
2nd pressure hPa : 150  
Rack travel in m: 10.25...10.45  
3rd pressure hPa : 300  
Rack travel in m: 11.25...11.45

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 91.5...94.5  
1000 s: (89.0...97.0)

Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 93.5...96.5  
1000 s: (91.0...99.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 52.0...54.0  
1000 s: (50.0...56.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.0  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (107.0...123.0)

## LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.7...3.9  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 11.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 274 005

Injection pump  
Pump designation :  
PES6MW100/720RS1519-

EP type number : 0 413 204 017  
Governor  
Governor design. :  
RSV350...1200MWA356  
Governor no. : 0 420 085 231

Cust. part no. : 0250740802

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 103.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200  
Rack travel in mm : 13.75...13.85  
Del.quantity cm3/ : 12.4...12.6  
100 s : (12.1...12.9)  
Spread cm3 : 0.4  
100 s : (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 1.0...1.4  
100 s : (0.7...1.6)  
Spread cm3 : 0.3  
100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.3...0.7

Governor spring pre-tension  
Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 1500  
Del.quantity : 127.0...129.0  
1000 : (124.0...132.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 92...100

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

Testing:

1st rack travel in: 12.8  
Speed rpm : 1240...1250  
4th rack travel in: 1400  
Speed rpm : 0.3...1.7

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 3.8...4.0

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 13.75...13.85  
2nd speed rpm : 750  
Rack travel in m: 13.7...13.9

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.7...13.9

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.4...10.6  
2nd pressure hPa : 450  
Rack travel in m: 11.05...11.25  
3rd pressure hPa : 700  
Rack travel in m: 12.6...12.8

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 750

Del.quantity cm3/ : 129.0...133.0  
1000 s: (126.0...136.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 62.0...64.0  
1000 s: (60.0...66.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.8  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 11.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 274 006

Injection pump  
Pump designation :  
PES6MW100/720RS1519-

3  
EP type number : 0 413 204 018  
Governor  
Governor design. :  
RSV350...1200MWOA356

-1  
Governor no. : 0 420 085 232

Cust. part no. : 0250740702

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test Lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)

Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.95...12.05

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 350.0

Rack travel in mm : 3.8...4.0

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.3...0.7

Governor spring pre-tension  
Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1500

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version



Control lever  
position degrees: 92...100

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

Testing:

1st rack travel in: 11.0  
Speed rpm : 1240...1250  
4th rack travel in: 1400  
Speed rpm : 0.3...1.7

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 3.8...4.0

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.95...12.05  
2nd speed rpm : 750  
Rack travel in m: 11.9...12.1

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 11.9...12.1

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.7...10.9  
2nd pressure hPa : 450  
Rack travel in m: 11.05...11.25

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 750

Del.quantity cm3/ : 93.5...96.5  
1000 s: (91.0...99.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 75.0...77.0  
1000 s: (73.0...79.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.0  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 09.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 276 005

Injection pump  
Pump designation :  
PES6MW100/720RS1517-

EP type number : 0 413 206 020  
Governor  
Governor design. :  
RSV350...1200MWA355  
Governor no. : 0 420 085 228

Cust. part no. : 0250740102

Customer spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 100.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness : 8.00X2.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.0...11.1

Del. quantity cm<sup>3</sup>/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 2.9...3.1  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.3...0.7

Governor spring pre-tension

Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1000

Del. quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 92...100

### Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

### Testing:

1st rack travel in: 10.0  
Speed rpm : 1240...1245  
2nd rack travel in: 4.0  
Speed rpm : 1300...1307  
4th rack travel in: 1400  
Speed rpm : 0.3...1.7

### LOW IDLE 1

#### Control lever

position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.0

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 2.9...3.1

### SET IDLE AUXILIARY SPRING

Speed rpm : 390  
Rack travel in mm : 2.00

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.0...11.1  
2nd speed rpm : 750  
Rack travel in m: 10.95...11.15

### Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 10.95...11.15

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.9...10.1  
2nd pressure hPa : 300  
Rack travel in m: 10.4...10.6  
3rd pressure hPa : 380  
Rack travel in m: 10.8...11.0

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 87.5...90.5  
1000 s: (85.0...93.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 68.0...70.0  
1000 s: (66.0...72.0)

### BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 10.0  
Speed rpm : 1240...1245

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 2.9...3.1  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 07.04.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 276 006

Injection pump  
Pump designation :  
PES6MW100/72ORS1517-

3  
EP type number : 0 413 206 020  
Governor  
Governor design. :  
RSV350...1200MWA355

-1  
Governor no. : 0 420 085 229

Cust. part no. : 0250740202

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 120.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.4...11.5

Del. quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 3.2...3.4  
Del. quantity cm3/ : 1.0...1.4  
100 s: (0.7...1.6)

Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.3...0.7

Governor spring pre-tension  
Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 1000  
Del. quantity : 101.0...103.0  
1000 : (99.0...105.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 92...100

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

Testing:

1st rack travel in: 10.4  
Speed rpm : 1240...1245  
4th rack travel in: 1400  
Speed rpm : 0.3...1.7

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 3.2...3.4

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.4...11.5  
2nd speed rpm : 750  
Rack travel in m: 11.35...11.55

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.35...11.55

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.55...9.75  
2nd pressure hPa : 350  
Rack travel in m: 9.9...10.1  
3rd pressure hPa : 530  
Rack travel in m: 10.9...11.1

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 97.5...101.5  
1000 s: (95.0...103.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 62.0...64.0  
1000 s: (60.0...66.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.4  
Speed rpm : 1240...1245

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 3.2...3.4  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:  
Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 11.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 276 007

Injection pump  
Pump designation :  
PES6MW100/72ORS1517-

3  
EP type number : 0 413 206 020  
Governor  
Governor design. :  
RSV350...1200MWOA355

-2  
Governor no. : 0 420 085 230

Cust. part no. : 0250740302

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 140.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.95...13.05

Del. quantity cm<sup>3</sup>/ : 11.7...11.9  
100 s: (11.5...12.1)

Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 3.2...3.4  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.3...0.7

Governor spring pre-tension  
Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 1000  
Del. quantity : 117.0...119.0  
1000 : (115.0...121.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 92...100

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

Testing:

1st rack travel in: 12.0  
Speed rpm : 1240...1245  
4th rack travel in: 1400  
Speed rpm : 0.3...1.7

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 3.2...3.4

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200  
Rack travel in m: 12.95...13.05  
2nd speed rpm : 750  
Rack travel in m: 12.9...13.1

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.9...13.1

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.55...9.75  
2nd pressure hPa : 350  
Rack travel in m: 9.9...10.1

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 750

Del.quantity cm3/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 62.0...64.0  
1000 s: (60.0...66.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.0  
Speed rpm : 1240...1245

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 3.2...3.4  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 11.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 276 009

Injection pump  
Pump designation :  
PES6MW100/720RS1517-

EP type number : 0 413 206 019  
Governor  
Governor design. :  
RSV350...1200MWA357  
Governor no. : 0 420 085 233

Cust. part no. : 0250740402

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kw : 155.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 21.00...0.00  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.0...14.1

Del.quantity cm3/ : 12.7...12.9  
100 s: (12.4...13.2)

Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 350.0  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.3...0.7

Governor spring pre-tension  
Click setting x : 4.5

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 1500  
Del.quantity : 127.0...129.0  
1000 : (124.0...132.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 104...112



Setting point:

Speed rpm : 800  
Rack travel in mm : 0.5

Testing:

1st rack travel in: 13.0  
Speed rpm : 1240...1245  
2nd rack travel in: 4.0  
Speed rpm : 1366...1370  
4th rack travel in: 1450  
Speed rpm : 0.3...1.7

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 3.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 3.8...4.0

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 14.0...14.1  
2nd speed rpm : 750  
Rack travel in m: 13.95...14.15

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.95...14.15

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.45...8.65  
2nd pressure hPa : 350  
Rack travel in m: 10.4...10.6  
3rd pressure hPa : 750  
Rack travel in m: 12.9...13.1

FUEL DELIVERY CHARACTERISTICS

1st version

J15

Aneroid pressure h: 1500  
Speed rpm : 750  
Del.quantity cm3/ : 125.0...129.0  
1000 s: (122.0...132.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 42.0...44.0  
1000 s: (40.0...46.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.0  
Speed rpm : 1240...1245

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 3.8...4.0  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.04.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 302  
Injection pump  
Pump designation : PES6MW100/720RS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. :  
RQV300...1300MW50-24  
Governor no. : 0 420 083 270

Cust. part no. : 0220745202

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.9...11.0

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.4...10.0

2nd speed rpm : 1350

travel mm : 8.5...8.7

3rd speed rpm : 500

travel mm : 2.7...3.3

4th speed rpm : 300

travel mm : 1.2...1.6

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.95  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1500  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.0  
Speed rpm : 300  
Rack travel in mm : 6.1...6.3

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.9...11.0  
2nd speed rpm : 750  
Rack travel in m: 11.5...11.6  
3rd speed rpm : 1100  
Rack travel in m: 11.1...11.3

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.5...11.6

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.8...9.9  
2nd pressure hPa : 200  
Rack travel in m: 10.2...10.3  
3rd pressure hPa : 300  
Rack travel in m: 11.0...11.3

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 84.5...87.5  
1000 s: (82.0...90.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
  
full load rack tr: 9.95  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.1...6.3  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.04.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 302  
Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. :  
RQV300...1300MW50-24  
Governor no. : 0 420 083 270

Cust. part no. : 0220745202

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 10.9...11.0  
Del. quantity cm<sup>3</sup>/ : 8.8...9.0  
100 s : (8.6...9.2)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.1...6.3  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s : (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
travel mm : 9.4...10.0  
2nd speed rpm : 1350  
travel mm : 8.5...8.7  
3rd speed rpm : 500  
travel mm : 2.7...3.3  
4th speed rpm : 300  
travel mm : 1.2...1.6

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 700  
Del. quantity : 88.0...90.0  
1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.95  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1500  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.0  
Speed rpm : 300  
Rack travel in mm : 6.1...6.3

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.9...11.0  
2nd speed rpm : 750  
Rack travel in m: 11.5...11.6  
3rd speed rpm : 1100  
Rack travel in m: 11.1...11.3

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.5...11.6

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.8...9.9  
2nd pressure hPa : 200  
Rack travel in m: 10.2...10.3  
3rd pressure hPa : 300  
Rack travel in m: 11.0...11.3

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 84.5...87.5  
1000 s: (82.0...90.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.95  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.1...6.3  
Del. quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.04.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 303  
Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1300MW50-24

Governer no. : 0 420 083 270

Cust. part no. :

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.9...11.0

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.4...10.0

2nd speed rpm : 1350

travel mm : 8.5...8.7

3rd speed rpm : 500

travel mm : 2.7...3.3

4th speed rpm : 300

travel mm : 1.2...1.6

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.95  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1500  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.0  
Speed rpm : 300  
Rack travel in mm : 6.1...6.3

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.9...11.0  
2nd speed rpm : 750  
Rack travel in m: 11.5...11.6  
3rd speed rpm : 1100  
Rack travel in m: 11.1...11.3

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.5...11.6

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.8...9.9  
2nd pressure hPa : 200  
Rack travel in m: 10.2...10.3  
3rd pressure hPa : 300  
Rack travel in m: 11.0...11.3

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 84.5...87.5  
1000 s: (82.0...90.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.95  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.1...6.3  
Del. quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.04.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 303

Injection pump  
Pump designation :  
PES6MW100/720RS1131-

1  
EP type number : 0 413 406 165  
Governor  
Governor design. :  
RQV300...1300MW50-25  
Governor no. : 0 420 083 271

Cust. part no. : 0220745302

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 155.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test Lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.9...13.0

Del. quantity cm<sup>3</sup>/ : 9.5...9.7

100 s: (9.3...9.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.4...6.6  
Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
travel mm : 9.4...10.0  
2nd speed rpm : 1350  
travel mm : 8.5...8.7  
3rd speed rpm : 500  
travel mm : 2.7...3.3  
4th speed rpm : 300  
travel mm : 1.2...1.6

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 1000



Del.quantity : 95.0...97.0  
1000 : (93.0...99.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 11.95  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.0  
Speed rpm : 300  
Rack travel in mm : 6.4...6.6

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 12.9...13.0  
2nd speed rpm : 750  
Rack travel in m: 12.85...13.05  
3rd speed rpm : 500  
Rack travel in m: 10.5...10.6

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.9...13.0

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.5...10.6  
2nd pressure hPa : 200  
Rack travel in m: 11.2...11.3  
3rd pressure hPa : 350  
Rack travel in m: 12.4...12.7

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 84.0...88.0  
1000 s: (82.0...90.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 41.0...43.0  
1000 s: (39.0...45.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 11.95  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.4...6.6  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 28.04.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 309  
Injection pump  
Pump designation : PES6MW100/720RS1227  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQV325...1300MW126  
Governor no. : 0 420 083 279

Cust. part no. : 1249951

Customer spec. information  
Customer : DAF

Engine : NS156L

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10

Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.0...13.1

Del. quantity cm<sup>3</sup>/ : 11.0...11.2

100 s : (10.8...11.4)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 325.0  
Rack travel in mm : 4.4...4.6  
Del. quantity cm<sup>3</sup>/ : 0.7...1.1  
100 s : (0.45...1.35)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.4...8.8  
2nd speed rpm : 875  
travel mm : 4.9...5.1  
3rd speed rpm : 500  
travel mm : 2.7...3.3  
4th speed rpm : 325  
travel mm : 1.5...1.9

## GUIDE SLEEVE POSITION

Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del. quantity : 110.0...112.0  
1000 : (109.0...114.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 12.05  
Speed rpm : 1324...1340  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.0...13.1  
2nd speed rpm : 1300  
Rack travel in m: 12.95...13.15  
3rd speed rpm : 600  
Rack travel in m: 10.0...10.2

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.0...13.1

Measurement  
Speed 1/min : 600

1st pressure hPa : 390  
Rack travel in m: 12.2...12.3  
2nd pressure hPa : 190  
Rack travel in m: 10.9...11.1  
3rd pressure hPa : -  
Rack travel in m: 10.0...10.2

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000

Speed rpm : 1300  
Del.quantity cm3/ : 105.5...108.5  
1000 s: (103.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 63.0...65.0  
1000 s: (62.0...67.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

Full load rack tr: 12.05  
Speed rpm : 1324...1340

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 31.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 309

Injection pump  
Pump designation : PES6MW100/720RS1227  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQV325...1300MW126  
Governor no. : 0 420 083 279

Cust. part no. : 1249951/5

Customer-spec. information  
Customer : DAF

Engine : NS156L

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10

Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.0...13.1

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 0.7...1.1

100 s: (0.45...1.35)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.42...1.92

2nd speed rpm : 363  
travel mm : 1.8...2.3

3rd speed rpm : 490  
travel mm : 2.68...3.18

4th speed rpm : 877  
travel mm : 4.75...5.25

5th speed rpm : 1345  
travel mm : 8.33...8.83

## GUIDE SLEEVE POSITION

Speed rpm : 1350

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 110.0...112.0

1000 : (109.0...114.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 119...127

Testing:  
1st rack travel in: 12.05  
Speed rpm : 1324...1340  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

## LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

## TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.0...13.1  
2nd speed rpm : 1300  
Rack travel in m: 12.95...13.15

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.0...13.1

## Measurement

Speed 1/min : 600  
1st pressure hPa : 390  
Rack travel in m: 12.2...12.3  
2nd pressure hPa : 190  
Rack travel in m: 10.9...11.1  
3rd pressure hPa : -  
Rack travel in m: 10.0...10.2

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000

Speed rpm : 1300  
Del.quantity cm3/ : 105.5...108.5  
1000 s: (103.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 63.0...65.0  
1000 s: (62.0...67.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.05  
Speed rpm : 1324...1340

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 28.04.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 310

Injection pump  
Pump designation :  
PES6MW100/720RS1227Z  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQV325...1300MW126  
Governor no. : 0 420 083 279

Cust. part no. : 1249952

Customer-spec. information  
Customer : DAF

Engine : NS133L

1st version kW : 133.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 11.7...11.8  
Del.quantity cm3/ : 9.25...9.45  
100 s: (9.15...9.65)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 325.0  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 0.7...1.1  
100 s: (0.45...1.35)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.4...8.8  
2nd speed rpm : 875  
travel mm : 4.9...5.1  
3rd speed rpm : 500  
travel mm : 2.7...3.3  
4th speed rpm : 325  
travel mm : 1.5...1.9

## GUIDE SLEEVE POSITION

Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 92.5...94.5  
1000 : (91.5...96.5)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 10.75  
Speed rpm : 1324...1340  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

## LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

## TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.7...11.8  
2nd speed rpm : 1300  
Rack travel in m: 11.65...11.85  
3rd speed rpm : 600  
Rack travel in m: 9.8...10.0

## Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.7...11.8

Measurement  
Speed 1/min : 600

1st pressure hPa : 290  
Rack travel in m: 11.2...11.3  
2nd pressure hPa : 160  
Rack travel in m: 10.3...10.5  
3rd pressure hPa : -  
Rack travel in m: 9.8...10.0

## FUEL DELIVERY CHARACTERISTICS

1st version

K01

Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 89.5...92.5  
1000 s: (87.0...95.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 62.0...64.0  
1000 s: (60.0...66.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.75  
Speed rpm : 1324...1340

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 31.05.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 310  
  
Injection pump  
Pump designation :  
PES6MW100/720RS1227Z  
EP type number : 0 413 406 217  
Governor  
Governor design. : RQV325...1300MW126  
Governor no. : 0 420 083 279

Cust. part no. : 1249952/3

Customer-spec. information  
Customer : DAF

Engine : NS133L

1st version kw : 133.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.7...11.8

Del.quantity cm3/ : 9.25...9.45

100 s: (9.15...9.65)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 0.7...1.1

100 s: (0.45...1.35)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.42...1.92

2nd speed rpm : 363  
travel mm : 1.8...2.3

3rd speed rpm : 490  
travel mm : 2.68...3.18

4th speed rpm : 872  
travel mm : 4.72...5.22

5th speed rpm : 1334  
travel mm : 8.23...8.73

## GUIDE SLEEVE POSITION

Speed rpm : 1350

Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 92.5...94.5

1000 : (91.5...96.5)



Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 10.75  
Speed rpm : 1324...1340  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.7...11.8  
2nd speed rpm : 1300  
Rack travel in m: 11.65...11.85

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.7...11.8

Measurement  
Speed 1/min : 600

1st pressure hPa : 290  
Rack travel in m: 11.2...11.3  
2nd pressure hPa : 160  
Rack travel in m: 10.3...10.5  
3rd pressure hPa : -  
Rack travel in m: 9.8...10.0

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 89.5...92.5  
1000 s: (87.0...95.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 62.0...64.0  
1000 s: (60.0...66.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.75  
Speed rpm : 1324...1340

LOW IDLE  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 28.04.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 314  
  
Injection pump  
Pump designation : PES6MW100/720RS1227  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQ325/1300MW129  
Governor no. : 0 420 082 070

Cust. part no. : 1249932

Customer-spec. information  
Customer : DAF

Engine : NS156L

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10

K04

Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.0...13.1

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 0.7...1.1

100 s: (0.45...1.35)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1360

travel mm : 6.3...6.7

2nd speed rpm : 1300

travel mm : 5.9...6.1

3rd speed rpm : 450

travel mm : 3.5...4.1

4th speed rpm : 325

travel mm : 1.7...2.1

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 800

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Setting point:  
Speed rpm : 800  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.05  
Speed rpm : 1334...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 74...78  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

SET IDLE AUXILIARY SPRING  
Speed rpm : 475  
Rack travel in mm : 2.0

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.0...13.1  
2nd speed rpm : 1300  
Rack travel in m: 12.95...13.15  
3rd speed rpm : 600  
Rack travel in m: 10.0...10.2  
4th speed rpm : 1000  
Rack travel in m: 13.95...14.15

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.0...13.1

Measurement  
Speed 1/min : 600

1st pressure hPa : 390  
Rack travel in m: 12.2...12.3  
2nd pressure hPa : 190  
Rack travel in m: 10.9...11.1  
3rd pressure hPa : -  
Rack travel in m: 10.0...10.2

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1300  
Del.quantity cm3/ : 105.5...108.5  
1000 s: (103.0...111.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 63.0...65.0  
1000 s: (61.0...67.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.05  
Speed rpm : 1334...1350

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 31.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 314

Injection pump  
Pump designation : PES6MW100/720RS1227  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQ325/1300MW129  
Governor no. : 0 420 082 070

Cust. part no. : 1249932/5

Customer-spec. information  
Customer : DAF

Engine : NS156L

1st version kw : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10

K06

Rack travel in mm : 13.5  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.0...13.1

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 0.7...1.1

100 s: (0.45...1.35)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.76...1.96

2nd speed rpm : 424

travel mm : 3.25...3.45

3rd speed rpm : 600

travel mm : 5.9...6.1

4th speed rpm : 1300

travel mm : 5.9...6.1

5th speed rpm : 1357

travel mm : 6.26...6.46

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 800

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Setting point:  
Speed rpm : 800  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 12.05  
Speed rpm : 1334...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 74...78  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 225  
Minimum rack travel: 6.0  
Speed rpm : 325  
Rack travel in mm : 4.4...4.6

SET IDLE AUXILIARY SPRING  
Speed rpm : 475  
Rack travel in mm : 2.0

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in mm : 13.0...13.1  
2nd speed rpm : 1300  
Rack travel in mm : 12.95...13.15  
3rd speed rpm : 600  
Rack travel in mm : 10.0...10.2  
4th speed rpm : 1000  
Rack travel in mm : 13.95...14.15

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.0...13.1

Measurement

K07

Speed 1/min : 600

1st pressure hPa : 390  
Rack travel in mm : 12.2...12.3  
2nd pressure hPa : 190  
Rack travel in mm : 10.9...11.1  
3rd pressure hPa : -  
Rack travel in mm : 10.0...10.2

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h : 1000  
Speed rpm : 1300  
Del. quantity cm<sup>3</sup>/ : 105.5...108.5  
1000 s : (103.0...111.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s : (7.0)  
Aneroid pressure h : -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 63.0...65.0  
1000 s : (61.0...67.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 12.05  
Speed rpm : 1334...1350

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.4...4.6  
Del. quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s : (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s : (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI  
 Edition : 22.05.94  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 316  
 Injection pump  
 Pump designation :  
 PES6MW100/320RS1216-  
 1  
 EP type number : 0 413 406 223  
 Governor  
 Governor design. :  
 RQV350...1175MW113-2  
 Governor no. : 0 420 083 248

Customer spec. information  
 Customer : RVI

Engine : MIDR 060226 X

1st version kW : 166.0  
 Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 4.2...4.3  
 Rack travel in mm : 11.5...14.5  
 Firing order : 1- 5- 3- 6- 2-  
 4

Phasing :  
 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175  
 Rack travel in mm : 13.8...14.0  
 Del. quantity cm3/ : 12.2...12.4  
 100 s: (12.0...12.6)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 275  
 Rack travel in mm : 5.95...6.35  
 Del. quantity cm3/ : 2.8...3.2  
 100 s: (2.55...3.45)  
 Spread cm3 : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.61...1.11  
 2nd speed rpm : 468  
 travel mm : 2.21...2.71  
 3rd speed rpm : 620  
 travel mm : 3.38...3.88  
 4th speed rpm : 929  
 travel mm : 5.13...5.63  
 5th speed rpm : 1266  
 travel mm : 6.86...7.36

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1460  
 Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1175  
 Aneroid pressure h: 1000

Del.quantity : 122.0...124.0  
1000 : (120.0...126.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 301...309

#### Testing:

1st rack travel in: 12.95  
Speed rpm : 1230...1240  
2nd rack travel in: 4.00  
Speed rpm : 1440...1480  
4th rack travel in: 1600  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 244...252  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 6.15

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.95  
Speed rpm : 275  
Rack travel in mm : 5.95...6.35

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.9...14.0  
2nd speed rpm : 700  
Rack travel in m: 13.9...14.0

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.9...14.0

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.05...10.65  
2nd pressure hPa : 520  
Rack travel in m: 13.15...11.25  
3rd pressure hPa : 350  
Rack travel in m: 10.95...11.25

#### FUEL DELIVERY CHARACTERISTICS

K09

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 129.5...133.5  
1000 s: (126.5...136.5)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 67.0...69.0  
1000 s: (65.0...71.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.95  
Speed rpm : 1230...1240

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 95.0...115.0  
1000 s: (92.0...118.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.95...6.35  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI  
Edition : 20.05.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 317

Injection pump  
Pump designation :  
PES6MW100/320RS1214-  
1  
EP type number : 0 413 406 224  
Governor  
Governor design. :  
RQV275...1250MW115-K  
Governor no. : 0 420 083 994

Customer spec. information  
Customer : RVI

Engine : MIDR 060226 W

1st version kW : 151.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 4.2...4.3  
Rack travel in mm : 16.5...19.5  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 14.1...14.2  
Del. quantity cm3/ : 11.8...12.0  
100 s: (11.6...12.2)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 275  
Rack travel in mm : 5.95...6.35  
Del. quantity cm3/ : 1.9...2.3  
100 s: (1.65...2.55)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 0.751...1.25  
2nd speed rpm : 390  
travel mm : 2.14...2.64  
3rd speed rpm : 550  
travel mm : 3.67...4.17  
4th speed rpm : 924  
travel mm : 6.52...7.02  
5th speed rpm : 1344  
travel mm : 9.74...10.24

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1000



Del.quantity : 118.0...120.0  
1000 : (116.0...122.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

Testing:  
1st rack travel in: 13.15  
Speed rpm : 1305...1315  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
4th rack travel in: 1600  
Speed rpm : 0.0...1.0

LOW IDLE 1  
Control lever  
position degrees: 240...248  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 6.05

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.65  
Speed rpm : 275  
Rack travel in mm : 5.95...6.15

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 14.1...14.2

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.95...11.35  
2nd pressure hPa : 300  
Rack travel in m: 12.35...12.45  
3rd pressure hPa : 200  
Rack travel in m: 11.65...11.95

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 115.5...118.5  
1000 s: (113.0...121.0)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (77.0...83.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.15  
Speed rpm : 1305...1315

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 95.0...115.0  
1000 s: (92.0...118.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.95...6.15  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI  
Edition : 20.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 318

Injection pump  
Pump designation :  
PES6MW100/320RS1214-

EP type number : 0 413 406 224  
Governor  
Governor design. :  
RQV275...1250MW115-1

Governer no. : 0 420 083 992

Customer-spec. information  
Customer : RVI

Engine : MIDR 060226 V

1st version kW : 129.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

K12

Prestroke mm : 4.2...4.3  
Rack travel in mm : 16.5...19.5  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.1...13.2

Del.quantity cm<sup>3</sup>/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 275  
Rack travel in mm : 5.45...5.85  
Del.quantity cm<sup>3</sup>/ : 1.9...2.3  
100 s: (1.65...2.55)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 0.76...1.26  
2nd speed rpm : 389  
travel mm : 2.14...2.64  
3rd speed rpm : 560  
travel mm : 3.77...4.27  
4th speed rpm : 924  
travel mm : 6.53...7.03  
5th speed rpm : 1344  
travel mm : 9.75...10.25

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Aneroid pressure h: 1000

Del.quantity : 112.0...114.0  
1000 : (110.0...116.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 296...304

#### Testing:

1st rack travel in: 12.15  
Speed rpm : 1295...1315  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1600  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 238...246  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.65

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.25  
Speed rpm : 275  
Rack travel in mm : 5.45...5.85

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.1...13.2  
2nd speed rpm : 700  
Rack travel in m: 12.2...12.3

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 13.1...13.2

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.05...11.45  
2nd pressure hPa : 240  
Rack travel in m: 12.6...12.7  
3rd pressure hPa : 120  
Rack travel in m: 11.6...11.9

#### FUEL DELIVERY CHARACTERISTICS

K13

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 108.5...111.5  
1000 s: (106.0...114.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 89.0...91.0  
1000 s: (87.0...93.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 12.15  
Speed rpm : 1300...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 95.0...115.0  
1000 s: (92.0...118.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.45...5.85  
Del.quantity cm3/ : 19.0...23.0  
1000 s: (16.5...25.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI  
Edition : 20.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 319

Injection pump  
Pump designation :  
PES6MW100/320RS1216-

EP type number : 0 413 406 223  
Governor  
Governor design. : RQV275...1250MW124K  
Governor no. : 0 420 083 989

Customer-spec. information  
Customer : RVI

Engine : MIDR 060226 U

1st version kW : 110.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 4.2...4.3

Rack travel in mm : 11.5...14.5  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.2...13.3

Del.quantity cm3/ : 10.6...10.8

100 s: (10.4...11.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 275  
Rack travel in mm : 5.85...6.25  
Del.quantity cm3/ : 2.0...2.4  
100 s: (1.75...2.65)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275  
travel mm : 0.75...1.25  
2nd speed rpm : 390  
travel mm : 2.14...2.64  
3rd speed rpm : 550  
travel mm : 3.77...4.27  
4th speed rpm : 924  
travel mm : 6.53...7.03  
5th speed rpm : 1344  
travel mm : 9.75...10.25

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.2...17.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Del.quantity : 106.0...108.0  
1000 : (104.0...110.0)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 296...304

#### Testing:

1st rack travel in: 12.25  
Speed rpm : 1305...1315  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1600  
Speed rpm : 0.0...1.0

#### LOW IDLE 1

Control lever  
position degrees: 241...249  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 6.05

#### Testing:

Speed rpm : 200  
Minimum rack trave: 6.65  
Speed rpm : 275  
Rack travel in mm : 5.85...6.25

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.2...13.3  
2nd speed rpm : 700  
Rack travel in m: 11.85...11.95

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del.quantity cm3/ : 93.0...96.0  
1000 s: (90.5...98.5)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.25  
Speed rpm : 1305...1315

#### STARTING FUEL DELIVERY

Speed rpm : 100

K15

Del.quantity cm3/ : 95.0...115.0  
1000 s: (92.0...118.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.85...6.25  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 31.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 474 020

Injection pump  
Pump designation : PES4MM100/720RS1212  
EP type number : 0 413 404 114  
Governor  
Governor design. :  
RSV350...1200MWA346

-4  
Governor no. : 0 420 085 180

Cust. part no. : 0180747202

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM364LA

1st version kW : 99.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 688 901 101

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.7...3.8  
: (3.65...3.85)  
Rack travel in mm : 9.0...12.0  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 13.5...13.6

Del.quantity cm3/ : 9.3...9.5

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.8

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.3...1.0

Governor spring pre-tension

Click setting x : 5.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 96.0...98.0

1000 : (94.0...10.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 12.55

Speed rpm : 1240...1245

2nd rack travel in: 4.00

Speed rpm : 1289...1294

4th rack travel in: 1450

Speed rpm : 0.3...1.7

LOW IDLE 1

Rack travel in mm : 6.4

Testing:

Speed rpm : 100

Minimum rack travel: 19.0

Speed rpm : 350

Rack travel in mm : 6.0...6.8

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 13.5...13.6

2nd speed rpm : 600

Rack travel in m: 13.45...13.65

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 13.5...13.6

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.65...10.85

2nd pressure hPa : 200

Rack travel in m: 11.9...12.0

3rd pressure hPa : 375

Rack travel in m: 12.9...13.2

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 600

Del.quantity cm3/ : 84.5...87.5

1000 s: (82.0...90.0)

Spread cm3 : 5.00

1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 39.0...41.0

1000 s: (37.0...43.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.55

Speed rpm : 1240...1245

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 85.0...95.0

1000 s: (83.0...98.0)

LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.0...6.8

Del.quantity cm3/ : 10.0...14.0

1000 s: (7.5...16.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 06.06.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 476 099A

Injection pump  
Pump designation : PES6MW100/320RS1209  
EP type number : 0 413 406 200  
Governor  
Governor design. : RSV300...900MW1A802  
Governor no. : 0 420 085 113

Cust. part no. : 3-7112

Customer-spec. information  
Customer : MAN

Engine : D0826LE20

1st version kW : 141.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30  
: (3.15...3.35)  
Rack travel in mm : 14.0...16.0  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 850  
Rack travel in mm : 14.80...14.90  
Del. quantity cm3/ : 14.8...15.0  
100 s : (14.5...15.3)  
Spread cm3 : 0.3  
100 s : (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.6...7.4  
Del. quantity cm3/ : 3.4...3.8  
100 s : (3.15...4.05)  
Spread cm3 : 0.3  
100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 2.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 850  
Del. quantity : 148.0...150.0  
1000 : (145.0...153.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 88...96



Setting point:

Speed rpm : 800  
Rack travel in mm : 0.65

Testing:

1st rack travel in: 13.80  
Speed rpm : 900...905  
2nd rack travel in: 4.00  
Speed rpm : 936...941  
4th rack travel in: 1050  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.0  
Speed rpm : 300  
Rack travel in mm : 6.6...7.4

SET IDLE AUXILIARY SPRING

Speed rpm : 340  
Rack travel in mm : 2.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 900...905

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.60...7.40  
Del.quantity cm3/ : 34.0...38.0  
1000 s: (31.5...40.5)  
Spread cm3 : 6.00  
1000 s: (9.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VME  
Edition : 30.05.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 136  
Injection pump  
Pump designation : PES6MW100/320RS1237  
EP type number : 0 413 406 233  
Governor  
Governor design. :  
RSV300...1100MW1A353  
Governor no. : 0 420 085 223

Customer-spec. information  
Customer : VME

Engine : TD61GD

1st version kW : 92.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.0...13.0  
Firing order : 1- 5- 3- 6- 2- 4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.15...13.25

Del.quantity cm3/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 315.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.4...0.8

100 s: (0.15...1.05)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 105.0...107.0

1000 : (102.0...109.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 106...114

Setting point:

Speed rpm : 800

Rack travel in mm : 0.65

Testing:

1st rack travel in: 12.20  
Speed rpm : 1135...1145  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 315  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 315  
Rack travel in mm : 6.4...6.6

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.15...13.25  
2nd speed rpm : 500  
Rack travel in m: 13.8...14.0  
3rd speed rpm : 660  
Rack travel in m: 13.4...13.6

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1135...1145

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 83.0...97.0  
1000 s: (100.0...80.0)  
Rack travel in mm : 20.0...21.0

LOW IDLE

Speed rpm : 315  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 4.0...8.0  
1000 s: (1.5...10.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 31.05.94  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 486 105

Injection pump  
Pump designation : PES6MW100/321RS1231  
EP type number : 0 413 406 225  
Governor  
Governor design. :  
RSV300...1100MWA343

-1  
Governor no. : 0 420 085 209

Cust. part no. : 3-7263

Customer spec. information  
Customer : MAN

Engine : D0826LE522

1st version kW : 154.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.45...3.65)  
Rack travel in mm : 9.0...13.0  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.05...12.15

Del. quantity cm<sup>3</sup>/ : 14.3...14.5  
100 s: (14.0...14.8)

Spread cm<sup>3</sup> : 0.4  
100 s: (0.7)

2nd speed rpm : 300  
Rack travel in mm : 4.9...5.1  
Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
100 s: (0.65...1.55)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1000  
Del. quantity : 143.0...145.0  
1000 : (140.0...148.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.65

Testing:

1st rack travel in: 11.00  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 300  
Rack travel in mm : 4.9...5.1

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.0

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.05...12.15  
2nd speed rpm : 900  
Rack travel in m: 12.3...12.4  
3rd speed rpm : 600  
Rack travel in m: 12.3...12.5

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.3...12.5

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.4...9.5  
2nd pressure hPa : 150  
Rack travel in m: 9.7...9.8  
3rd pressure hPa : 600  
Rack travel in m: 11.6...11.9

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.9...5.1  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 05.06.94  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 486 108  
  
Injection pump  
Pump designation : PES6MW100/321RS1208  
EP type number : 0 413 406 199  
Governor  
Governor design. :  
RSV350...900MW1A360-

1  
Governor no. : 0 420 085 239

Cust. part no. : 3-7311

Customer-spec. information  
Customer : MAN

Engine : D0826LE102

1st version kW : 154.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.45...3.65)  
Rack travel in mm : 9.0...13.0  
Firing order : 1- 5- 3- 6- 2-  
4

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 870

Rack travel in mm : 14.85...14.95

Del. quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 350  
Rack travel in mm : 4.4...4.6  
Del. quantity cm<sup>3</sup>/ : 1.1...1.5  
100 s: (0.85...1.75)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 3.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del. quantity : 158.0...160.0  
1000 : (155.0...163.0)  
Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 87...95

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.65

Testing:

1st rack travel in: 13.80  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 965...975  
4th rack travel in: 1050  
Speed rpm : 0.30...1.70  
5th rack travel in: 965...995  
Speed rpm : 4.00

LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.0  
Speed rpm : 350  
Rack travel in mm : 4.4...4.6

SET IDLE AUXILIARY SPRING

Speed rpm : 350  
Rack travel in mm : 4.9...5.1

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 870  
Rack travel in m: 14.85...14.95  
2nd speed rpm : 500  
Rack travel in m: 14.8...15.0  
3rd speed rpm : 700  
Rack travel in m: 14.8...15.0

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (137.0...163.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.4...4.6

Del.quantity cm3/ : 11.0...15.0  
1000 s: (8.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM  
Edition : 07.06.94  
Replaces : 16.07.93  
Test oil : ISO-4113

Combination no. : 9 400 085 243

Injection pump  
Pump designation : PES4A80D320RS1282-1  
EP type number : 9 400 083 097  
Governor  
Governor design. :  
RS350/1500A2C2073-2R  
Governor no. : 9 420 083 269

Customer-spec. information  
Customer : MWM

Engine : D 229-4

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75  
: (2.60...2.80)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 5.8...5.9

100 s: (5.6...6.0)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 0.7...1.0

100 s: (0.5...1.2)

Spread cm3 : 0.4

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1500

Del.quantity : 58.0...59.0

1000 : (56.5...60.5)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 111...119

Testing:



1st rack travel in: 8.20  
Speed rpm : 1580...1590  
2nd rack travel in: 4.00  
Speed rpm : 1625...1655  
4th rack travel in: 1800  
Speed rpm : 0.30...1.70

Remarks:

:

#### LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 250  
Minimum rack trave: 6.80  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 4.00  
Speed rpm : 430...490  
Speed rpm : 550  
Maximum rack trave: 3.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 500  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 900  
Rack travel in m: 10.20...10.40  
4th speed rpm : 1200  
Rack travel in m: 9.50...9.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 58.0...61.0  
1000 s: (56.5...62.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 62.5...65.5  
1000 s: (61.0...67.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1540...1550

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 7.6.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 087 484  
Injection pump  
Pump designation : PES5P120A720LS7280  
EP type number : 9 400 087 087  
Governor  
Governor design. : RQV300...1050PA1114  
Governor no. : 9 420 080 361

Customer-spec. information  
Customer : MRECEDES-BENZ

Engine : OM 449 LA

1st version kW : 184.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70  
: (4.55...4.75)  
Rack travel in mm : 21.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 0.9...1.5  
100 s: (0.6...1.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1050  
travel mm : 7.70...7.90

2nd speed rpm : 300  
travel mm : 0.50...1.00

3rd speed rpm : 500  
travel mm : 3.00...3.50

4th speed rpm : 700  
travel mm : 5.20...5.70

5th speed rpm : 1165  
travel mm : 9.20...9.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1115

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 193.0...195.0  
1000 : (190.0...198.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

#### Testing:

1st rack travel in: 11.10  
Speed rpm : 1105...1115  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 79...87

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.20...5.40

#### CONSTANT REGULATION

Speed rpm : 250...400

#### TORQUE CONTROL

Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.0...12.2  
2nd speed rpm : 800  
Rack travel in m: 13.0...13.2  
3rd speed rpm : 900  
Rack travel in m: 12.7...12.9  
4th speed rpm : 950  
Rack travel in m: 12.4...12.6

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 12.20...12.40

#### Measurement

Speed 1/min : 600

1st pressure hPa : 360  
Rack travel in m: 10.60...10.80  
2nd pressure hPa : 500

L01

Rack travel in m: 11.60...11.80  
3rd pressure hPa : 1080  
Rack travel in m: 12.40...12.50  
4th pressure hPa : 1200  
Rack travel in m: 12.70...12.90  
5th pressure hPa : -  
Rack travel in m: 10.10...10.40

#### START CUT-OUT

Speed 1/min : 250 (260)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1050  
Del.quantity cm3/ : 194.0...198.0  
1000 s: (191.0...201.0)  
Spread cm3 : 8.00  
1000 s: (12.)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 218.5...222.5  
1000 s: (215.5...225.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (117.0...125.0)  
Spread cm3 : 5.00  
1000 s: (9.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1105...1115

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 26.05.94  
replaces : 12.93  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F1350R418-2  
Type number : 0 460 404 076  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0824 GF 03

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 24

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 76.00...77.00  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 7.00...13.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1420  
Del. quantity cm3/  
1000S.: 58.00...62.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 64.00...66.00  
mind 1000S.: 65.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1350  
TD travel mm: 6.00...6.80  
mm: -  
electromagnet Volt: 24  
2nd speed 1/min: 1200  
TD travel mm: 4.30...5.10  
mm: (4.00...5.40)  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 900  
TD travel mm: 1.00...1.80  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 4.30...5.00  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 1000  
Supply-pump  
pressure bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1200  
Supply-pump  
pressure bar: 7.40...8.00  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...86.40  
quantity cm<sup>3</sup>/10s: (26.70...101.40)  
2nd speed 1/min: 1350  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 1550  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
2nd speed 1/min: 1510  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: -  
3rd speed 1/min: 1460  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: -  
4th speed 1/min: 1420  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 58.00...62.00  
1000S.: (53.50...66.50)  
5th speed 1/min: 1350

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 75.70...78.70  
1000S.: (74.20...80.20)

6th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 76.00...77.00  
1000S.: (74.00...79.00)

7th speed 1/min: 800  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 77.00...81.00  
1000S.: (75.50...82.50)

8th speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.00...69.00  
1000S.: (62.00...70.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (4.50...15.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 65.00...105.00  
1000S.: (65.00...105.00)

2nd speed 1/min: 450

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 64.00...66.00  
1000S.: (64.00...66.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.0...1.2
Ya	mm: 37.4...41.4
Yb	mm: 39.4...44.6

Remarks:

: MAN 51.11103-721

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Pump with slave plunger

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 09.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1300R529  
Type number : 0 460 424 097  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T4.40 110TI "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 688 901 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1200  
Setting value mm: 1.50...1.70  
Shutoff  
electromagnet Volt: 24

## Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1200  
Setting value bar: 6.00...6.60  
Shutoff  
electromagnet Volt: 24

## Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1200  
Del. quantity cm3/  
1000S.: 73.50...74.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.0)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 57.50...58.50

Shutoff  
electromagnet Volt: 24

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 8.00...12.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

## Full-load speed regulation

Speed 1/min: 1440  
Charge press hPa: 1200  
Del. quantity cm3/  
1000S.: 48.00...52.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 80.00...140.00  
mind 1000S.: 80.00

Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 950  
Charge press hPa: 1200  
TD travel mm: 2.40...3.00  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 850  
Charge press hPa: 1200  
TD travel mm: 1.50...1.70  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 750  
Charge press hPa: 1200  
TD travel mm: 0.30...0.90  
mm: (0.00...1.20)

Shutoff  
electromagnet Volt: 24  
5th speed 1/min: 1300  
Charge press. hPa: 1200  
TD travel mm: 3.00...3.60  
mm: (2.60...4.00)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Charge press. hPa: 1200  
Supply-pump pressure bar: 7.90...8.50

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 850  
Charge press. hPa: 1200  
Supply-pump pressure bar: 6.00...6.60

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 500  
Charge press. hPa: 1200  
Supply-pump pressure bar: 4.50...5.10

Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1300  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 550  
LDA-stroke mm: 5.6  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 68.50...69.50  
1000S.: (66.00...72.00)

2nd speed 1/min: 1580  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1500  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 24.00...36.00  
1000S.: (20.00...40.00)

5th speed 1/min: 1440  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 48.00...52.00  
1000S.: (44.00...56.00)

9th speed 1/min: 1300  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 76.00...79.00  
1000S.: (74.00...81.00)

12th speed 1/min: 1000  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.50...74.50  
1000S.: (71.00...77.00)

16th speed 1/min: 700  
Charge press. hPa: -  
Shutoff  
electromagnet volt: 24  
Del. quantity cm<sup>3</sup>/: 53.50...58.50  
1000H.: (52.50...59.50)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 57.50...58.50  
1000S.: (55.00...61.00)

20th speed 1/min: 700  
Charge press. hPa: 1200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 72.00...75.00  
1000S.: (70.00...77.00)



Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1300  
Charge press. hPa: 1200  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 8.00...12.00  
1000S.: (5.00...15.00)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: (35.00...75.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

L07

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS1	mm: 1.0...1.3
SVS max.	mm: -
LDA stroke	mm: 5.6
Ya	mm: 31.5...33.5
Yb	mm: 47.7...56.3

Remarks:

:  
:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 09.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1200R568  
Type number : 0 460 424 101  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : D 0824 LFL 01  
"DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 44.00...46.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 688 901 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1500  
Setting value mm: 2.00...2.40

AFB/AFB  
valve Volt: 12

Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1500  
Setting value bar: 6.40...7.00  
KSB/AFB  
valve Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1500  
Del. quantity cm3/  
1000S.: 107.50...108.50

KSB/AFB  
valve Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 60.50...61.50

KSB/AFB 11  
valve Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 8.00...12.00

KSB/AFB  
valve Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1500  
Del. quantity cm3/  
1000S.: 72.00...78.00

KSB/AFB  
valve Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 100.00...160.00  
mind 1000S.: 100.0

KSB/AFB  
Valve Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1000  
 Charge press hPa: 1500  
 TD travel mm: 3.60...4.40  
 mm: (3.30...4.70)

KSB/AFB  
 valve Volt: 12  
 3rd speed 1/min: 850  
 Charge press hPa: 1500  
 TD travel mm: 2.00...2.40  
 mm: (1.50...2.90)

KSB/AFB  
 valve Volt: 12  
 4th speed 1/min: 750  
 Charge press hPa: 1500  
 TD travel mm: 0.60...1.40  
 mm: (0.30...1.70)

KSB/AFB  
 valve Volt: 12  
 5th speed 1/min: 1200  
 Charge press. hPa: 1500  
 TD travel mm: 4.50...5.30  
 mm: (4.50...5.30)

KSB/AFB  
 valve Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 550  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 4.90...5.50

KSB/AFB  
 valve Volt: 12  
 2nd speed 1/min: 850  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 6.40...7.00

KSB/AFB  
 valve Volt: 12  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1500  
 Supply-pump pressure bar: 8.10...8.70

KSB/AFB  
 valve Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Overflow quantity cm3/10s: 41.70...86.10  
 (26.70...101.10)

2nd speed 1/min: 1200  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12

Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 550  
 Charge-air pressure-setting point hPa: 400  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 83.50...84.50  
 1000S.: (81.50...86.50)

2nd speed 1/min: 1370  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

3rd speed 1/min: 1340  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 4.50...19.5  
 1000S.: -

5th speed 1/min: 1300  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 72.00...78.00  
 1000S.: -

8th speed 1/min: 1260  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 97.00...103.00  
 1000S.: (95.00...105.00)

9th speed 1/min: 1200  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 101.00...106.00  
 1000S.: (99.50...107.50)

12th speed 1/min: 1000  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quynity cm3/: 107.50...108.50  
 1000S.: (105.50...110.50)

15th speed 1/min: 850  
 Charge press. hPa: 1500  
 KSB/AFB  
 valve Volt: 12  
 Del. quantity cm3/: 111.50...116.50  
 1000S.: (110.00...118.00)

17th speed 1/min: 700  
 Charge press. hPa: 1500  
 KSB solenoid-operated  
 valve volt: 12

Del. quantity cm<sup>3</sup>/: 110.00...115.00  
1000H.: (108.50...116.50)  
18th speed 1/min: 550  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...61.50  
1000S.: (58.00...64.00)  
20th speed 1/min: 550  
Charge press. hPa: 1500  
KSB/AFB  
valve Volt: 12  
Del. quantity cm<sup>3</sup>/: 109.50...118.50  
1000S.: (108.00...120.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1200  
Charge press. hPa: 1500  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

KSB/AFB  
valve Volt: 12

Idle delivery:

1st speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (10.00...20.00)

Dispersion cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

2nd speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 330  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...105.00  
1000S.: -

2nd speed 1/min: 430  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: -

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.00...46.00 L  
1000S.: (37.00...53.00)

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.0...160.0 V  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: KOT  
MS1 mm: 1.3...1.6  
Ya mm: 37.4...40.4  
Yb mm: 35.4...40.6

Ya = Distance between VE flange and  
speed-control lever in idle  
position :  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Pump with slave plunger

Starting delivery check  
V = Speed-control lever in full-load  
position

Starting delivery check  
L = Speed-control lever in idle  
position

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 10.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1150R587  
Type number : 0 460 424 105  
Customer Part-No. :

Customer-specific information  
Customer : MAN

Engine : "DI" 0824 LUE 521

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 688 901 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 900  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Charge press hPa: 1000  
Setting value bar: 6.70...7.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 107.50...108.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 62.50...63.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

11

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 18.00...22.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 1230  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 72.00...78.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 90.00...150.00  
mind 1000S.: 90.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.40...3.20  
mm: (2.10...3.50)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 900  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.30...2.70)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 450  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.70...5.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.70...7.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.10...7.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 450  
Charge press. hPa: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 1150  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 450  
Charge-air pressure-setting  
point hPa: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 89.50...90.50  
1000S.: (86.50...93.50)  
2nd speed 1/min: 1350  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1320  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)  
4th speed 1/min: 1270  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 15.00...55.00  
                     1000S.: (15.00...55.00)  
 5th speed 1/min: 1230  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 72.00...78.00  
                     1000S.: (66.50...83.50)  
 9th speed 1/min: 1150  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 95.00...100.00  
                     1000S.: (93.50...101.50)  
 10th speed 1/min: 1000  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 98.50...103.50  
                     1000S.: (97.00...105.00)  
 12th speed 1/min: 800  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 107.50...108.50  
                     1000S.: (105.50...110.50)  
 18th speed 1/min: 450  
 Charge press. hPa: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 62.50...63.50  
                     1000S.: (60.00...66.00)  
 20th speed 1/min: 450  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 107.50...116.50  
                     1000S.: (106.00...118.00)  
  
 Mech. shutoff:  
 Mech. Abstellung:  
  
 1st speed 1/min: 1150  
 Charge press. hPa: 1500  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12  
  
 Electr. shutoff:  
  
 1st speed 1/min: 300  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12  
  
 Idle delivery:  
  
 1st speed 1/min: 300  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 18.00...22.00  
                     1000S.: (13.50...26.50)  
 Dispersion cm3/: 6.0  
                     1000S.: (6.5)  
 2nd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 170  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 90.00...150.00  
                     1000S.: (90.00...150.00)  
  
 2nd speed 1/min: 220  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 30.00...90.00  
                     1000S.: (30.00...90.00)  
  
 4th speed 1/min: 100  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 90.00...150.00  
                     1000S.: (90.00...150.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS1	mm: 1.0...1.3
SVS max.	mm: 3.2
Ya	mm: 41.8...44.8
Yb	mm: 39.1...44.9

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Permissible port/port scatter with  
stop test, mechanical = max. 5.0  
ccm/1000 S.

Pump with slave plunger



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEN  
Edition : 13.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F2050L607  
Type number : 0 460 424 106  
Customer Part-No. :

Customer-specific information  
Customer : PENTA

Engine : AD/TAMD 31 CE "DI"

Power KW: 110

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 110

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 1000  
Setting value mm: 2.60...2.80

### Supply-pump pressure

Speed 1/min: 1600  
Charge press hPa: 1000  
Setting value bar: 6.70...7.30

### Full-load del. with charge press.:

Speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 77.50...78.50  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

### Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 43.50...44.50

### Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 12.00...16.00  
Del. quantity cm<sup>3</sup>/: 6.0  
1000S.: (6.0)

### Full-load speed regulation

Speed 1/min: 2250  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 28.00...32.00

### Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 45.00...95.00  
mind 1000S.: 45.00

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

2nd speed 1/min: 1700  
Charge press hPa: 1000  
TD travel mm: 3.00...3.60  
mm: (2.60...4.00)  
3rd speed 1/min: 1600  
Charge press hPa: 1000  
TD travel mm: 2.60...2.80  
mm: (2.00...3.40)  
4th speed 1/min: 1400  
Charge press hPa: 1000  
TD travel mm: 0.80...1.40  
mm: (0.40...1.80)

### Supply-pump pressure characteristic:

1st speed 1/min: 2050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 8.30...8.90  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.70...7.30  
3rd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.20...4.80

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 88.90...133.40  
(73.90...159.40)  
2nd speed 1/min: 2050  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 111.20...194.60  
(96.20...209.60)

### Delivery-quant. and breakaway char.:

1nd speed 1/min: 900  
Charge-air pressure-setting point hPa: 400  
Del. quantity cm<sup>3</sup>/1000S.: 62.00...63.00  
(59.50...65.50)  
2nd speed 1/min: 2320  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)  
5th speed 1/min: 2250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 28.00...32.00  
(24.00...36.00)  
9th speed 1/min: 2050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 74.00...77.00  
(72.50...78.50)  
12th speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 77.50...78.50  
(75.50...80.50)  
18th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000S.: 43.50...44.50  
(41.50...46.50)  
20th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 73.50...78.50  
(71.00...81.00)

### Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 2050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

### Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

Shutoff electromagnet volt: 12

### Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000S.: 12.00...16.00  
(9.00...19.00)  
Dispersion cm<sup>3</sup>/1000S.: 6.0  
(6.0)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000S.: 0.00...3.00  
(0.00...3.00)

### Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/1000S.: 70.00...110.00  
(70.00...110.00)

2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000S.: 20.00...50.00  
(20.00...50.00)

4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/1000S.: 45.00...95.00  
(45.00...95.00)

### Shutoff electromagnet:

Cut-in min voltage : 10.0  
Rated voltage : 12.0

### Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: KOT  
MS1 mm: 1.5...1.8  
Ya mm: 37.2...39.2  
Yb mm: 49.5...57.7

### Remarks:

Ya = Distance between VE flange and

speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Pump with slave plunger

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SNF  
Edition : 13.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200R265-2  
Type number : 0 460 426 183  
Customer Part-No. :

Customer-specific information  
Customer : SNF

Engine : WD 612.02/04

Power KW: 100

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Setting value mm: 1.50...1.90

Supply-pump pressure

Speed 1/min: 800  
Setting value bar: 5.50...6.10

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 90.50...91.50  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 16.00...20.00  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm3/  
1000S.: 21.00...27.00

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...140.00  
mind 1000S.: 90.00

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1200  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)  
3rd speed 1/min: 800  
TD travel mm: 1.50...1.90  
mm: (1.00...2.40)  
5th speed 1/min: 600  
TD travel mm: 0.20...1.00  
mm: (0.00...1.30)

Supply-pump pressure characteristic:

1st speed 1/min: 1200  
Supply-pump  
pressure bar: 7.20...7.80  
2nd speed 1/min: 800  
Supply-pump  
pressure bar: 5.50...6.10  
3rd speed 1/min: 600  
Supply-pump  
pressure bar: 4.50...5.10

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41.70...86.10  
 quantity cm3/10s: (26.70...101.10)  
 2nd speed 1/min: 1200  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1rd speed 1/min: 1380  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: -  
 2nd speed 1/min: 1300  
 Del. quantity cm3/: 21.00...27.00  
 1000S.: (18.00...30.00)  
 3rd speed 1/min: 1250  
 Del. quantity cm3/: 60.00...100.00  
 1000S.: -  
 4th speed 1/min: 1200  
 Del. quantity cm3/: 87.50...90.50  
 1000S.: (86.70...91.30)  
 5th speed 1/min: 1000  
 Del. quantity cm3/: 90.50...91.50  
 1000S.: (88.70...93.30)  
 6th speed 1/min: 500  
 Del. quantity cm3/: 88.00...90.00  
 1000S.: (87.00...92.00)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1200  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
 Del. quantity cm3/: 16.0...20.0  
 1000S.: (14.0...22.0)  
 Dispersion cm3/: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 350  
 Del. quantity cm3/: 4.50...10.50  
 1000S.: (3.50...11.50)  
 3rd speed 1/min: 400  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 280  
 Del. quantity cm3/: 65.00...85.00  
 1000S.: -

2nd speed 1/min: 150  
 Del. quantity cm3/: 100.0...150.0  
 1000S.: -

4th speed 1/min: 100  
 Del. quantity cm3/: 90.00...140.00  
 1000S.: -

Shutoff electromagnet:

Cut-in  
 min voltage : -  
 Rated voltage : -

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: 5.6...6.0  
 MS mm: 1.3...1.5  
 SVS max. mm: 5.4  
 Ya mm: 37.2...39.2  
 Yb mm: 53.8...62.2

Remarks:

:  
 :  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

Yb = Distance between VE flange and  
 speed-control lever in rated speed  
 position  
 Measurement point = edge of control  
 lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAX  
Edition : 13.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1200L385-4  
Type number : 0 460 426 214  
Customer Part-No. :

Customer-specific information  
Customer : MAXION

Engine : T 6.354

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.5  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 700  
Setting value mm: 1.70...2.10  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 700  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 101.5...102.5

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1210  
Del. quantity cm3/  
1000S.: 82.00...88.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 95.00...135.00  
mind 1000S.: 95.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1050  
TD travel mm: 2.90...3.70  
mm: (2.60...4.00)

electromagnet Volt: 12  
2nd speed 1/min: 700  
TD travel mm: 1.70...2.10  
mm: (1.20...2.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
TD travel mm: 0.40...1.20  
mm: (0.30...1.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1050  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 700  
Supply-pump  
pressure bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 1050  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.0...52.00  
1000S.: -  
2nd speed 1/min: 1210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.00...88.00  
1000S.: (79.00...91.00)  
3rd speed 1/min: 1050  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 111.0...115.00  
1000S.: (99.50...116.50)  
4th speed 1/min: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 101.5...102.5  
1000S.: (99.0...105.0)  
5th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 92.00...98.00  
1000S.: (90.00...100.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.0...17.0  
1000S.: (11.0...19.0)  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (5.0)  
2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.0...29.0  
1000S.: (19.0...31.0)  
3rd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: -  
2nd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 95.0...135.0  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
Ya	mm: 29.0...31.0
Yb	mm: 59.0...67.0

Remarks:

:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 13.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1300R596  
Type number : 0 460 426 236  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : 1006 E.6

### TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 688 901 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 1.30...1.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900  
Setting value bar: 6.3...6.9  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 42.00...43.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 10.5...11.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525  
Del. quantity cm3/  
1000S.: 31.0...35.0  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 90.00...150.00  
mind 1000S.: 90.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1300  
TD travel mm: 3.0...3.6  
mm: (2.6...4.0)  
electromagnet Volt: 12  
2nd speed 1/min: 1100  
TD travel mm: 2.00...2.60  
mm: (1.60...3.00)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000

TD travel mm: 1.30...1.50  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
TD travel mm: 0.10...0.70  
mm: (0.00...1.10)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 1300  
Supply-pump  
pressure bar: 7.80...8.40  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 6.30...6.90  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
Supply-pump  
pressure bar: 4.60...5.20  
Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.40  
quantity cm<sup>3</sup>/10s: (60.00...134.400)  
2nd speed 1/min: 1300  
Shutoff  
electromagnet Volt: 12  
Overflow : 97.30...180.70  
quantity cm<sup>3</sup>/10s: (82.30...195.70)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 1600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
2nd speed 1/min: 1525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.0...35.0  
1000S.: (25.0...41.0)  
3rd speed 1/min: 1450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.0...65.0  
1000S.: -  
4th speed 1/min: 1300

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.5...64.5  
1000S.: (59.0...66.0)  
5th speed 1/min: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.5...58.5  
1000S.: (55.0...61.0)  
6th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.0...53.0  
1000S.: (47.5...54.5)  
7th speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.0...43.0  
1000S.: (38.5...46.5)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.5...11.5  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: -  
2nd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 90.0...150.0  
1000S.: -

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 1.0...1.4
Ya	mm: 31.5...33.5
Yb	mm: 54.3...62.6

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 13.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1300R240-3  
Type number : 0 460 426 239  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : PHASER 180 TI

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.25  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 0.40...1.20

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 98.50...99.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 86.50...87.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm3/  
1000S.: 16.5...20.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1460  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 120.0...160.0  
mind 1000S.: 120.0  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

1st speed 1/min: 1300  
 Charge press hPa: 1000  
 TD travel mm: 2.2...2.6  
 mm: (1.7...3.1)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 1.10...1.90  
 mm: (0.80...2.20)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 0.40...1.20  
 mm: (0.10...1.50)

Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.90...4.50  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.10...6.70  
 Shutoff

electromagnet Volt: 12  
 3rd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.30...7.90  
 Shutoff

electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...86.10  
 quantity cm<sup>3</sup>/10s: (26.70...101.10)

2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700

# Charge-air pressure-setting point hPa: 400

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 94.00...95.00  
 1000S.: (91.00...98.00)

2nd speed 1/min: 1580  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...7.00  
 1000S.: (0.00...7.00)

3rd speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 47.00...53.00  
 1000S.: (44.00...56.00)

5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 95.00...98.00  
 1000S.: (93.0...100.0)

6th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 86.5...87.5  
 1000S.: (84.0...90.0)

7th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 98.5...99.5  
 1000S.: (96.0...102.0)

Mech. shutoff:  
 Mech. Abstellung:

1st speed 1/min: 1300  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

# Electr. shutoff:

1st speed 1/min: 300  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: -

# Idle delivery:

1st speed 1/min: 300

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.50...20.50  
1000S.: (13.50...23.50)

Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

2nd speed 1/min: 400

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 350

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 4.5...10.5  
1000S.: (2.5...12.5)

Automatic starting fuel delivery:

1st speed 1/min: 230

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: -

2nd speed 1/min: 150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 120.0...160.0  
1000S.: -

4th speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 120.0...160.0  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

KF mm: KOT  
MS1 mm: 1.0...1.3  
SVS max. mm: 6.0  
Ya mm: 37.2...39.2  
Yb mm: 50.4...58.6

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and

speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F230UR598  
Type number : 0 460 484 074  
Customer Part-No. :

Customer-specific information  
Customer : RENAULT

Engine : F8Q - 620

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 3.50...3.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 32.3...33.3  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 410  
Del. quantity cm3/  
1000S.: 7.5...11.5  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm3/  
1000S.: 24.5...30.5  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Inj.-qty. cm3/  
difference 1000S.: -9.0...-15.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: -1.4...-1.6 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2000  
TD travel mm: 5.7...6.5  
mm: (5.5...6.7)  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
TD travel mm: 3.5...3.9  
mm: (3.2...4.2)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 600  
TD travel mm: 0.8...1.6  
mm: (0.6...1.8)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2000  
Supply-pump  
pressure bar: 7.20...7.80  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 600  
Supply-pump  
pressure bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...86.10  
quantity cm<sup>3</sup>/10s: (26.70...101.10)  
2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950

M02

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)  
3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...14.50  
1000S.: (5.50...15.50)  
4th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.5...30.5  
1000S.: (23.5...31.5)  
5th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.3...34.3  
1000S.: (31.0...35.6)  
6th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.3...34.3  
1000S.: (31.0...35.6)  
7th speed 1/min: 1650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.1...33.1  
1000S.: (29.3...33.9)  
8th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.30...33.30  
1000S.: (30.50...35.10)  
9th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...34.50  
1000S.: (30.70...35.30)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12



Del. quantity cm<sup>3</sup>/: 7.50...11.50  
1000S.: (5.50...13.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/ : -7.0...-9.0 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 2.0...8.0 ' Z  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -1.6...-2.2 '  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.1...-0.3 "  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

2nd speed 1/min: 210  
Shutoff  
electromagnet Volt: 12

M03

Del. quantity cm<sup>3</sup>/: 45.0...75.0  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.4  
MS mm: 1.1...1.5  
Ya mm: 32.6...36.6  
Yb mm: 67.1...79.9

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Z = Absolute delivery

Pump with slave plunger

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE5/8F2100L525-4  
Type number : 0 460 485 015  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2,4L WK-SD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 7.10...7.70  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 35.0...36.0  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 7.0...9.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 540  
Del. quantity cm3/  
1000S.: 6.50...7.50  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Del. quantity cm3/  
1000S.: 10.00...14.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...75.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -6.5...-14.5 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500

TD-travel  
difference mm: -1.1...-1.3 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1790  
TD travel mm: 5.90...6.70  
mm: (5.60...7.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 4.10...4.50  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1100  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1100  
Supply-pump  
pressure bar: 5.90...6.50

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 7.10...7.70

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1790  
Supply-pump  
pressure bar: 7.80...8.40

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.80...97.30)

2nd speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm3/10s: (40.70...167.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.00...14.00  
1000S.: (8.00...16.00)

8th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 17.00...27.00  
1000S.: (16.00...28.00)

9th speed 1/min: 2100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 28.50...30.50  
1000S.: (27.30...31.70)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm3/: 35.0...36.0  
1000S.: (33.3...37.7)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 31.80...34.80  
1000S.: (30.30...36.30)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 2100  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 415  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 415  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...9.00  
1000S.: (4.00...12.00)

# High Idle:

1st speed 1/mi: 465  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...9.00  
1000S.: (4.00...12.00)

# Residual:

1. Rotacao 1/min: 540  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.50...7.50  
1000S.: (5.00...9.00)

# Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : 0.0...3.0 ' Z  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -1.5...-2.7 '  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.6...-1.4 '  
difference bar: -  
Shutoff  
electromagnet Volt: 12

# Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 35.00...75.00  
1000S.: (35.00...75.00)

# Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

# Mounting and assembly dimensions:

# Designation

K	mm: 3.2...3.4
KF	mm: 5.6...6.0
MS	mm: 1.3...1.5
Ya	mm: 32.8...34.8
Yb	mm: 61.5...68.5

# Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

Z = Absolute delivery

On initial measurement, screw in  
residual-quantity adjusting screw 2 mm.

Following pump adjustment, screw out  
residual-quantity adjusting screw 2 mm.

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F900R399  
Type number : 0 460 494 266  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : 4A 2.3 GEN.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel

Speed 1/min: 750  
Setting value mm: 2.5...2.9  
Shutoff  
electromagnet Volt: 12

### Supply-pump pressure

Speed 1/min: 7500

Setting value bar: 2.8...3.4  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 850  
Del. quantity cm3/  
1000S.: 43.5...44.5  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

### Full-load speed regulation

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 34.5...38.5  
Shutoff  
electromagnet Volt: 12

### Start:

Speed 1/min: 100  
Del. quantity cm3/: 55.00...85.00  
mind 1000S.: 55.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 850  
TD travel mm: 2.7...3.5  
mm: (2.4...3.8)  
electromagnet Volt: 12  
2nd speed 1/min: 750  
TD travel mm: 2.50...2.90  
mm: (2.00...3.40)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 500  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)  
Shutoff  
electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 850  
Supply-pump  
pressure bar: 3.10...3.70  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 2.80...3.40

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 500  
 Supply-pump  
 pressure bar: 1.80...2.40  
 Shutoff  
 electromagnet Volt: 12  
  
 Overflow quantity at overflow valve:  
  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (27.80...97.30)  
 2nd speed 1/min: 850  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...133.30  
 quantity cm<sup>3</sup>/10s: (26.70...148.90)  
  
 Delivery-quant. and breakaway char.:  
  
 3rd speed 1/min: 970  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 4th speed 1/min: 940  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...7.00  
 1000S.: (0.00...7.00)  
 5th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 34.50...38.50  
 1000S.: (32.50...40.50)  
 6th speed 1/min: 850  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 43.50...44.50  
 1000S.: (42.00...46.00)  
 7th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.50...45.50  
 1000S.: (42.00...46.00)  
  
 Mech. shutoff:  
  
 Electr. shutoff:  
  
 1st speed 1/min: 900  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

Damper set qty.:  
  
 Automatic starting fuel delivery:  
  
 1st speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...55.00  
 1000S.: -  
  
 2nd speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 60.00...90.00  
 1000S.: -  
  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...85.00  
 1000S.: -

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 5.6...6.0
MS	mm: 1.8...2.0
Ya	mm: 59.0...67.0
Yb	mm: -

Remarks:

:  
 :  
 :  
 Ya = Distance between VE flange and  
 speed-control lever in idle  
 position  
 Measurement point = edge of control  
 lever on drive end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ONA  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F1300R315-1  
Type number : 0 460 494 268  
Customer Part-No. :

Customer-specific information  
Customer : ONAN

Engine : 4 A 2.3

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Setting value mm: 1.90...2.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm3/  
1000S.: 39.5...40.5  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 7.50...11.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 1350  
Del. quantity cm3/  
1000S.: 27.00...31.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...90.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300  
TD travel mm: 3.10...3.90  
mm: (2.80...4.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
TD travel mm: 1.90...2.30  
mm: (1.40...2.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
 Supply-pump  
 pressure bar: 2.70...3.30  
 Shutoff  
 electromagnet Volt: 12

2nd speed 1/min: 1000  
 Supply-pump  
 pressure bar: 3.30...3.90  
 Shutoff  
 electromagnet Volt: 12

3rd speed 1/min: 1300  
 Supply-pump  
 pressure bar: 4.40...5.00  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...125.10  
 quantity cm<sup>3</sup>/10s: (26.70...125.10)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1480  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

3rd speed 1/min: 1370  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...40.00  
 1000S.: (10.00...40.00)

5th speed 1/min: 1350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 27.00...31.00  
 1000S.: (25.00...33.00)

9th speed 1/min: 1300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 41.00...44.00  
 1000S.: (39.50...45.50)

12th speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 39.50...40.50  
 1000S.: (38.00...42.00)

20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.50...38.50  
 1000S.: (34.50...39.50)

Mech. shutoff:

Idle delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.50...11.50  
 1000S.: (6.00...13.00)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)

2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...80.00  
 1000S.: (50.00...80.00)

2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.00...50.00  
 1000S.: (20.00...50.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...90.00  
 1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.1...3.4
KF	mm: 5.6...6.0
MS	mm: 0.9...1.3
Ya	mm: 37.2...39.2
Yb	mm: 27.5...32.5



Remarks:

;  
Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R411  
Type number : 0 460 494 270  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN-MISA

Engine : LD20

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 3.30...3.70  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

M12

Speed 1/min: 1200  
Setting value bar: 5.10...5.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 2200  
Del. quantity cm3/  
1000S.: 32.0...33.0  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

11

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 7.50...11.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 12.00...18.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 48.00...52.00  
mind 1000S.: 48.00  
KSB/AFB  
Valve Volt: 12

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 900  
Inj.-qty. cm3/  
difference 1000S.: -8.6...-12.6 #  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 900  
TD-travel  
difference mm: -0.7...-0.9 #  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2300  
TD travel mm: 7.70...8.50  
mm: (7.60...8.60)

KSB/AFB  
valve Volt: 12  
electromagnet Volt: 12  
2nd speed 1/min: 1800  
TD travel mm: 6.00...6.80  
mm: (5.70...7.10)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
TD travel mm: 3.30...3.70  
mm: (2.80...4.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
TD travel mm: 1.50...2.30  
mm: (1.20...2.60)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2300

Supply-pump  
pressure bar: 8.20...8.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1800  
Supply-pump  
pressure bar: 6.80...57.4  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Supply-pump  
pressure bar: 5.10...5.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 900  
Supply-pump  
pressure bar: 4.20...4.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (26.80...98.30)  
2nd speed 1/min: 2300  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...152.90  
quantity cm3/10s: (41.70...167.90)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2850  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...5.00  
1000S.: (0.00...5.00)  
2nd speed 1/min: 2600  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 12.0...18.0  
 1000S.: (10.5...19.5)  
 3rd speed 1/min: 2400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.5...37.5  
 1000S.: (28.0...39.0)  
 4th speed 1/min: 2300  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 33.8...35.8  
 1000S.: (32.3...37.3)  
 5th speed 1/min: 2200  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.0...33.0  
 1000S.: (31.2...33.8)  
 6th speed 1/min: 1800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.0...34.0  
 1000S.: (30.5...35.5)  
 7th speed 1/min: 1200  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 31.0...34.0  
 1000S.: (30.0...35.0)  
 8th speed 1/min: 900  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 29.4...32.4  
 1000S.: (28.4...33.4)  
 9th speed 1/min: 600  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.0...33.0  
 1000S.: (29.0...34.0)  
  
 Mech. shutoff:  
 Mech. Abstimmung:  
  
 1st speed 1/min: 2300  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 12

M14

KSB/AFB  
 valve Volt: 12  
  
 Electr. shutoff:  
  
 1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -  
 KSB/AFB  
 valve Volt: 12  
  
 Damper set qty.:  
  
 LFG-setting:  
 solide con carcassa:  
 Idle delivery:  
  
 1st speed 1/min: 350  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.5...11.5  
 1000S.: (5.5...13.5)  
  
 High Idle:  
  
 1st speed 1/mi: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 7.0...11.0  
 1000S.: (5.0...13.0)  
  
 Residual:  
  
 1. Rotacao 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 1.00...5.00  
 1000S.: (1.00...5.00)  
  
 Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:  
  
 1st speed 1/min: 1250  
 Inj.-qty. cm<sup>3</sup>/: -6.5...-8.5 "  
 difference 1000S.: -  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Inj.-qty. cm<sup>3</sup>/: 2.0...8.0 " Z  
 difference 1000S.: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -0.4...-1.4 '  
difference mm: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 310  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

2nd speed 1/min: 210  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...65.00  
1000S.: -

4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 48.00...52.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 1.1...1.3  
SVS max. mm: 3.1  
Ya mm: 30.8...34.8  
Yb mm: 68.7...79.0

Remarks:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 14.06.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2150R281-1  
Type number : 0 460 494 276  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD11ATE-Y BVA

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 2.80...3.00  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 5.00...5.60  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 61.00...62.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 12.0...14.0

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 2.50...3.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2250  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 49.00...55.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...80.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 6.60...7.20  
mm: (6.20...7.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.80...3.00  
mm: (2.20...3.60)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.30...1.90  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.00...5.60

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.10...7.70

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 2000  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
Charge-air pressure-setting point hPa: 400  
LDA-stroke mm: 7.1  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...57.00  
1000S.: (53.50...59.50)

2nd speed 1/min: 2700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000S.: (4.00...12.00)

3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...40.50  
1000S.: (33.00...41.00)

5th speed 1/min: 2250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.00...55.00  
1000S.: (48.00...56.00)

9th speed 1/min: 2000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 56.00...59.00  
1000S.: (55.20...59.80)

10th speed 1/min: 1000  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.50...63.50  
1000S.: (59.50...64.50)

11th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.0...62.0  
1000S.: (58.0...63.0)

12th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.0...62.0  
1000S.: (59.2...63.8)

18th speed 1/min: 500  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 42.00...43.00  
1000S.: (40.20...44.80)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 2000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 325  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: -

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 12.00...14.00  
1000S.: (10.00...16.00)

2nd speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...11.00  
1000S.: (5.00...11.00)

High Idle:

1st speed 1/mi: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 11.00...13.00  
1000S.: (9.00...15.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...3.50  
1000S.: (0.50...5.50)

Part-load del. at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)

M18

Spacing mm: 12.0

1st speed 1/min: 1500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 3.TL  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.50...25.50  
1000S.: (22.00...28.00)

2nd speed 1/min: 500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 4.TL  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.5...21.5  
1000S.: -

Automatic starting fuel delivery:

2nd speed 1/min: 325  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...44.00  
1000S.: (36.50...44.50)

3rd speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...78.00  
1000S.: (74.50...79.50)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...80.00  
1000S.: (68.00...82.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.2...5.6  
MS mm: 0.9...1.3  
LDA stroke mm: 7.1  
Ya mm: 34.3...38.3  
Yb mm: 67.1...81.7

Remarks:

Add 12 mm spacer at 3rd



part-load-quantity stop.

Add 12 mm spacer at 4th  
part-load-quantity stop.

Pump with slave plunger

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 22.08.94  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 074 883  
Injection pump  
Pump designation : PES4M55C320RS185  
EP type number : 0 410 064 006  
Governor  
Governor design. : RSF375/1900M78  
Governor no. : 0 420 021 274

Customer-spec. information  
Customer : MB-PKW

Engine : OM601 D23

1st version kW : 72.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 111

Opening  
pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.75...13.85

Del.quantity cm3/ : 5.9...6.0

100 s: (5.8...6.1)

Spread cm3 : 0.3

100 s: (0.35)

2nd speed rpm : 375.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Aneroid pressure h: 1850

Del.quantity : 58.8...60.2

1000 : (57.7...61.3)

Spread cm3 : 3.00

1000 : (3.50)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.10...8.50

Speed rpm : 2200

4th rack travel in: 2600

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 900

Rack travel in mm : 1,9...2.0

## LOW IDLE 1

Control lever

position degrees: 6...10

Setting point w/out bumper spring





# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 22.08.94  
Replaces : 11.01.93  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 886  
  
Injection pump  
Pump designation : PES4M55C320RS167  
EP type number : 0 410 054 960  
Governor  
Governor design. : RSF375/2000M55-7  
Governor no. : 0 420 021 268

Customer-spec. information  
Customer : MB-PKW

Engine : OM601

1st version kW : 59.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 111

Opening  
pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 3.8...3.9

100 s: (3.7...4.0)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Del.quantity : 38.0...39.0

1000 : (37.0...40.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.65...9.15

Speed rpm : 2200

4th rack travel in: 2550

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 375

[illegible]

Testing:

```
Speed      rpm      : 250
Minimum rack travel: 10.2
Speed      rpm      : 375
Rack travel in mm : 5.10...5.30
Speed      rpm      : 1000
Maximum rack travel: 1.50
```

SET IDLE AUXILIARY SPRING

```
Speed      rpm      : 450
Rack travel in mm : 3,8...4,0
               : (3,7...4,1)
```

## TORQUE CONTROL

```

Torque control curve - 1st version
1st speed   rpm   : 1000
  Rack travel in m: 12.10...12.20
2nd speed   rpm   : 1800
  Rack travel in m: 11.80...12.00
3rd speed   rpm   : 2000
  Rack travel in m: 11.70...11.90

```

### FUEL DELIVERY CHARACTERISTICS

```

1st version
Speed          rpm      : 1800
Del.quantity   cm3/      : 40.0...41.6
                1000 s: (39.0...42.6)
Spread         cm3       : 2.50
                1000 s: (3.0)
Speed          rpm      : 2000
Del.quantity   cm3/      : 40.0...42.0
                1000 s: (39.0...43.0)
Spread         cm3       : 2.50
                1000 s: (3.00)

```

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/     : 54.0...0.0
                1000 s: (54.0...0.0)
Rack travel in mm : 20.10...0.00
```

HIGH IDLE

```

1st version
Speed          rpm      : 2200
Rack travel   in mm    : 8.65...9.15
Del.quantity  cm3/     : 29.0...33.0
                1000 s: (28.0...34.0)
Spread        cm3      : 2.50
                1000 s: (3.00)

```

LOW IDLE

```
Speed      rpm      : 375
Rack travel in mm : 5.10...5.30
Del.quantity cm3/   : 6.0...7.0
            1000 s : (5.5...10.0)
Spread     cm3      : 1.00
            1000 s : (1.50)
```

## SETTING PNEUMATIC FAST IDLE (FI)

Speed rpm : 425  
Rack travel in mm : 6.5...8.1  
Del.quantity cm3/ : 12.0...20.0  
1000 s : -  
Vacuum hPa : 400

Remarks:

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 =  $15.3^{\circ} \dots 15.7^{\circ}$   
( $15.2 \dots 15.8^{\circ}$ ) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max. 1° angular  
displacement of cam

### TESTING PNEUMATIC SHUTOFF DEVICE

With  $n = 375$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Sliding sleeve pre-travel = 6.25 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 22.03.94  
Replaces : 13.10.92  
Test oil : ISO-4113

Combination no. : 0 400 074 889

Injection pump  
Pump designation : PES4M55C32ORS172  
EP type number : 0 410 054 958  
Governor  
Governor design. : RSF375/2000M75-2  
Governor no. : 0 420 021 166

Customer spec. information  
Customer : MB-PKW

Engine : OM601

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 111

Opening  
pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

M25

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 3.3...3.4

100 s: (3.2...3.5)

Spread cm3 : 0.15

100 s: (0.25)

2nd speed rpm : 375.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.6...0.7

100 s: (0.5...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 33.0...34.0

1000 : (32.0...35.0)

Spread cm3 : 1.50

1000 : (2.50)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.20...8.60

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 900

Rack travel in mm : 1,4...1,5

## LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 375

### Testing:

```

Speed          rpm : 250
Minimum rack travel: 11.0
Speed          rpm : 375
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.5
Speed          rpm : 620...720
Speed          rpm : 900
Maximum rack travel: 1.50

```

### SET IDLE AUXILIARY SPRING

Speed rpm : 450  
Rack travel in mm : 4,8...5,0  
                              : (4,7...5,1)

## TORQUE CONTROL

Torque control curve - 1st version

1st speed	rpm	:	900
Rack travel in m:	12.30...12.40		
2nd speed	rpm	:	1400
Rack travel in m:	11.95...12.15		
3rd speed	rpm	:	2300
Rack travel in m:	11.30...11.50		

## Aneroid/Altitude Compensator Test

## 1st version

```
Setting
Speed      rpm      : 900
Pressure   hPa      : 950
Rack travel mm    : 0.00...0.20
```

## Measurement

Speed 1/min : 500

```
1st pressure hPa : 900
  Rack travel in m: 0.50...0.70
2nd pressure hPa : 750
  Rack travel in m: 1.80...2.20
```

## FUEL DELIVERY CHARACTERISTICS

1st version

```

Aneroid pressure h: 1100
Speed          rpm  : 1400
Del.quantity   cm3/ : 33.0...34.6
                1000 s: (32.0...35.6)
Spread         cm3  : 2.50
                1000 s: (3.0)
Aneroid pressure h: 1100
Speed          rpm  : 2300
Del.quantity   cm3/ : 34.0...36.0
                1000 s: (33.0...37.0)
Spread         cm3  : 2.50
                1000 s: (3.00)

```

STARTING FUEL DELIVERY

```
Speed          rpm      : 100
Del.quantity   cm3/      : 52.0...0.0
                1000 s : (52.0...0.0)
Rack travel    in mm     : 20.10...0.00
```

## HIGH IDLE

1st version

```

Aneroid pressure h: 1100
Speed            rpm : 2500
Rack travel in mm: 8.20...8.60
Del.quantity cm3/ : 18.0...22.0
                  1000 s: (17.0...23.0)
Spread          cm3 : 2.50
                  1000 s: (3.00)

```

LOW IDLE

```
Speed          rpm      : 375
Rack travel in mm : 6.40...6.60
Del.quantity cm3/  : 6.0...7.0
                1000 s : (5.5...10.0)
Spread         cm3    : 1.00
                1000 s : (2.50)
```

## SETTING PNEUMATIC FAST IDLE (F.I.A.)

Speed rpm : 425  
 Rack travel in mm : 8.1...9.7  
 Del.quantity cm3/ : 12.0...20.0  
 1000 s: -  
 Vacuum hPa : 400

## Remarks:

```
: ARD 900 1/MIN
: RW=1.55...1.85 MM
: FM=6.5...8.5
```

Sliding sleeve pre-travel = 6.5 mm

Start-of-delivery sensor system:  
adjustment and blocking with device  
KDEP 1077 = 16.8°...17.2°  
(16.7...17.3°) angular displacement of  
cam following start of delivery of  
cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF



-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 22.08.94  
Replaces : 22.03.91  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 896  
  
Injection pump  
Pump designation : PES4M55C320RS104-1  
EP type number : 0 410 054 963  
Governor  
Governor design. : RSF375/2200M21  
Governor no. : 0 420 021 148

Customer-spec. information  
Customer : MB-NFZ

Engine : OM616 2.4L ADA  
1st version kW : 55.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 012

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 1 688 901 111

Opening  
pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
: (1.65...1.85)  
Rack travel in mm : 20.00...0.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 3.7...3.8

100 s: (3.6...3.9)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 375.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 0.7...0.8

100 s: (0.65...1.0)

Spread cm3 : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del.quantity : 37.0...38.0

1000 : (36.0...39.0)

Spread cm3 : 2.50

1000 : (3.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 50...0

3rd rack travel in: 8.20...8.60

Speed rpm : 2350

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 375

Rack travel in mm : 6.1

## Testing:

Speed rpm : 250

Minimum rack travel: 10.00

Speed rpm : 375

Rack travel in mm : 6.10...6.30

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : 22.08.94  
Edition : 03.07.89  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 074 897  
  
Injection pump  
Pump designation : PES4M55C32ORS172  
EP type number : 0 410 054 958  
Governor  
Governor design. : RSF360/2300M60-25  
Governor no. : 0 420 021 132

Customer-spec. information  
Customer : MB-PKW

Engine : OM601-Abgl. MJ90

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
                  : (1.65...1.85)  
Rack travel in mm : 20.00...22.00  
Firing order : 1- 3- 4- 2

NO2

Phasing : 0-90-180-270

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 3.2...3.3

100 s: (3.1...3.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

2nd speed rpm : 335.0

Rack travel in mm : 6.5...6.7

Del. quantity cm<sup>3</sup>/ : 0.5...0.6

100 s: (0.4...0.9)

Spread cm<sup>3</sup> : 0.1

100 s: (0.1)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100

Del. quantity : 32.0...33.0

1000 : (31.0...34.0)

Spread cm<sup>3</sup> : 2.50

1000 : (3.00)

## RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.20...8.60

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000

Rack travel in mm : 1.40...1.50

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring



cylinder no. 1.

Difference in start of delivery between  
max. and min. value = max.  $1^\circ$  angular  
displacement of cam

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 335$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

Sliding sleeve pre-travel = 6.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5/6 a10  
Edition : 4.8.94  
Replaces : 24.07.90  
Test oil : ISO-4113

Combination no. : 0 400 874 238 K

Injection pump  
Pump designation : PES4A95D410RS2685  
EP type number : 0 410 894 996  
Governor  
Governor design. :  
RSV400...1000A1C2187

L  
Governor no. : 0 420 232 387

Customer-spec. information  
Customer : LIEBHERR

Engine : D904 TB

1st version kW : 74.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance ± ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 10.20...10.30

Del. quantity cm<sup>3</sup>/ : 9.1...9.3

100 s: (8.9...9.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5

Del. quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 91.5...93.5

1000 : (89.5...95.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 91...99

Testing:

1st rack travel in: 9.20  
Speed rpm : 1020...1040  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
3rd rack travel in: 4.00  
Speed rpm : 1060...1090  
4th rack travel in: 1220  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 400  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 980  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.50...10.60  
3rd speed rpm : 720  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 82.5...85.5  
1000 s: (80.0...88.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 91.0...94.0  
1000 s: (88.5...96.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1020...1040

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 d 1  
Edition : 8.7.94  
Replaces : 16.02.94  
Test oil : ISO-4113

Combination no. : 0 403 456 116

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-8  
Governor no. : 0 420 082 063

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF 04

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.5...3.6  
: (3.3.45...3.65)  
Rack travel in mm : 9.0...12.0

Firing order : 1- 5- 3- 6- 2-

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 2.1...2.5

100 s: (1.85...2.75)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.3...9.7

2nd speed rpm : 1255

travel mm : 6.5...6.7

3rd speed rpm : 360

travel mm : 3.9...4.5

4th speed rpm : 250

travel mm : 1.6...2.0

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108...110

Speed rpm : 600

Rack travel in mm : 19.2...20.8

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 167.5...169.5

1000 : (164.5...172.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 12.6  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.6

### Testing:

Speed rpm : 150  
Minimum rack travel: 7.5  
Speed rpm : 250  
Rack travel in mm : 5.5...5.7

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.6...13.7

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.5...9.6  
2nd pressure hPa : 200  
Rack travel in m: 10.0...10.1  
3rd pressure hPa : 700  
Rack travel in m: 12.3...12.6

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 167.5...169.5  
1000 s: (164.5...172.5)

Spread cm3 : 4.00  
1000 s: (7.5)  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 174.0...178.0  
1000 s: (171.0...181.0)  
Spread cm3 : 6.00  
1000 s: (9.00)  
Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 163.0...167.0  
1000 s: (160.0...170.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.6  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 70.0...90.0  
1000 s: (67.0...93.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.5...5.7  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7137

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a  
Edition : 05.07.94  
Replaces : 27.09.93  
Test oil : ISO-4113

Combination no. : 9 400 083 449

Injection pump  
Pump designation :  
PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. :  
RSV400...1100A2C2209

R  
Governor no. : 9 420 083 201

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 9.00...12.00

N09

Firing order : 1- 5- 3- 6- 2-

Phasing :  
0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del. quantity cm3/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.8)

2nd speed rpm : 400.0

Rack travel in mm : 5.6...5.8

Del. quantity cm3/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm3 : 0.5

100 s: (0.9)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del. quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm3 : 3.50

1000 : (8.00)

## RATED SPEED

1st version

Control lever  
position degrees: 85...93

Testing:

1st rack travel in: 9.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.50  
5th speed rpm : 400  
Rack travel in m: 10.70...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 75.0...79.0  
1000 s: (73.0...81.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 134.0...150.0  
1000 s: (131.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm3 : 5.50  
1000 s: (9.00)

Remarks:

:

Start-of-delivery blocking 11° after  
start of delivery of cylinder no. 1.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column:

Test sheet : VWV  
Edition : 17.08.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F2250L614  
Type number : 0 460 406 078  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : STEYER TD/LLK

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 111

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1600  
Charge press. hPa: 750  
Setting value mm: 1.10...1.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

N11

Speed 1/min: 1600  
Charge press hPa: 750  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1600  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 39.50...40.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 29.0...30.0

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Charge press hPa: -  
Del. quantity cm3/  
1000S.: 9.00...11.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 11.00...15.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...75.00  
mind 1000S.: 45.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1250

Charge press hPa: 750  
 TD travel mm: 0.30...1.10  
                   mm: (0.00...1.40)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1600  
 Charge press hPa: 750  
 TD travel mm: 1.10...1.50  
                   mm: (0.60...2.00)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2150  
 Charge press hPa: 750  
 TD travel mm: 2.80...3.60  
                   mm: (2.50...3.90)  
 Shutoff  
 electromagnet Volt: 12  
  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 1250  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 5.20...5.80  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1600  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 6.10...6.70  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2150  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 7.50...8.10  
 Shutoff  
 electromagnet Volt: 12  
  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2150  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)  
  
 Delivery-quant. and breakaway char.:  
  
 1st speed 1/min: 800  
 Charge-air pressure-setting point hPa: 300

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 34.0...35.0  
                   1000s.: (31.5...37.5)  
 2nd speed 1/min: 2650  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 0.00...3.00  
                   1000s.: -  
 3rd speed 1/min: 2500  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 11.0...15.0  
                   1000s.: (9.0...17.0)  
 4th speed 1/min: 2400  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 27.00...37.0  
                   1000s.: (26.0...38.0)  
 5th speed 1/min: 2150  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 40.00...42.00  
                   1000s.: (38.80...43.20)  
 6th speed 1/min: 1600  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 39.50...40.50  
                   1000s.: (37.80...42.20)  
 7th speed 1/min: 800  
 Charge press. hPa: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 34.00...35.00  
                   1000s.: (31.50...37.50)  
 8th speed 1/min: 500  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 36.50...39.50  
                   1000s.: (35.00...41.00)  
 9th speed 1/min: 500  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/ 29.00...30.00  
                   1000s.: (26.50...32.50)  
  
 Mech. shutoff:  
  
 Electr. shutoff:  
 1st speed 1/min: 375  
 Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (6.00...14.00)

Automatic starting fuel delivery:

1st speed 1/min: 400  
Charge press. hPa: -  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: -

2nd speed 1/min: 260  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: -

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: 6.2...6.6
MS	mm: 1.6...2.0
Ya	mm: 8.5...10.5
Yb	mm: 69.7...88.3

Remarks:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 19.08.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/10F2150L470-2  
Type number : 0 460 406 079  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2.4 SD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 41.5...42.5

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 24.5...25.5

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2250  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: -  
Inj.-qty. cm3/  
difference 1000S.: -1.0...-5.0 #



Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1250  
 Charge press hPa: -  
 TD-travel  
 difference mm: -0.6...-0.8 #  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
 Charge press hPa: 750  
 TD travel mm: 0.60...1.40  
 mm: (0.30...1.70)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press hPa: 750  
 TD travel mm: 2.20...2.60  
 mm: (1.70...3.10)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1600  
 Charge press hPa: 750  
 TD travel mm: 4.00...4.80  
 mm: (3.70...5.10)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 750  
 Supply-pump  
 pressure bar: 3.30...3.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 750  
 Supply-pump  
 pressure bar: 5.20...5.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 750  
 Supply-pump  
 pressure bar: 7.50...8.10  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: -

Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2000  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 5.9  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 34.0...35.0  
 1000S.: (31.5...37.5)  
 2nd speed 1/min: 2400  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.0...6.0  
 1000S.: -  
 3rd speed 1/min: 2250  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...14.00  
 1000S.: (8.00...16.00)  
 4th speed 1/min: 2175  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 19.00...29.00  
 1000S.: (18.00...30.00)  
 5th speed 1/min: 1750  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 36.60...38.60  
 1000S.: (35.40...39.80)  
 6th speed 1/min: 1250  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 41.50...42.50  
 1000S.: (39.80...44.20)  
 7th speed 1/min: 600  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 37.70...40.70  
 1000S.: (36.20...42.20)  
 8th speed 1/min: 600  
 Charge press. hPa: -

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 24.50...25.50  
1000S.: (22.00...28.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff  
electromagnet volt: -

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...9.00  
1000S.: (4.00...12.00)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.0...4.0  
1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: -0.5...-1.5 "  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: -  
Inj.-qty. cm<sup>3</sup>/: 0.0...3.0 \* 2  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: -  
TD-travel : -1.1...-1.5 \*  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Charge press. hPa: -

Supply pump-  
pressure : -0.1...-0.3 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: -  
Supply pump-  
pressure : -0.5...-0.9 "  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 520  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...35.00  
1000S.: -

2nd speed 1/min: 320  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...75.00  
1000S.: -

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...65.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: 3.2...3.4
KF	mm: 6.2...6.6
MS	mm: 0.9...1.3
LDA stroke	mm: 5.9
Ya	mm: 31.5...33.5
Yb	mm: 50.3...62.6

Ya = Distance between VE flange and  
speed-control lever in idle  
position :  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control

lever on distributor-head end

Permissible port/port scatter with  
stop test, electrical = max. 5.0  
ccm/1000 S.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 17.08.94  
replaces : -  
Calibrating oil : ISG-4113  
  
Injection pump : VE6/10F2150L398-1  
Type number : 0 460 406 080  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 2.4 SD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.40...4.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 6.00...6.60

Full-load del. w/out charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 29.5...30.5

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 7.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2325  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...65.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm3/  
difference 1000S.: -8.00...-12.0 #  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: -0.6...-0.8 #  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

electromagnet Volt: 12  
2nd speed 1/min: 1500  
TD travel mm: 4.40...4.80  
mm: (3.90...5.30)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1700  
TD travel mm: 5.10...5.90  
mm: (4.80...6.20)

Shutoff  
electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump pressure bar: 6.00...6.60

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2150  
Supply-pump pressure bar: 7.90...8.50

Shutoff  
electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
(26.70...98.40)

2nd speed 1/min: 2150  
Shutoff  
electromagnet Volt: 12  
Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 2500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00

2nd speed 1/min: 2275  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 14.50...24.50  
(13.50...25.50)

3rd speed 1/min: 2150

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 21.50...23.50  
(20.30...24.70)

4th speed 1/min: 1850  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 23.20...25.80  
(21.50...27.50)

5th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 29.50...30.50  
(27.80...32.20)

6th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 26.00...29.00  
(24.50...30.50)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000s.: 0.00...3.00

Shutoff  
electromagnet volt: -

#### Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 7.00...9.00  
(4.00...12.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/1000s.: 0.0...3.0

#### Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/difference 1000s.: 0.0...3.0 \* Z  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel difference mm: -0.8...-1,8 \*  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:

pompa di mandata (FP):

1st speed 1/min: 1500

Supply pump-

pressure : -0.3...-1.1 \*

difference bar: -

Shutoff

electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 500

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 15.00...35.00

1000S.: -

2nd speed 1/min: 300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.00...75.00

1000S.: -

3rd speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.00...65.00

1000S.: -

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: -

MS mm: -

Ya mm: 31.5...33.5

Yb mm: 51.2...62.4

Remarks:

:  
:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position

Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position

Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : NIS  
Edition : 19.08.94  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/12F1400R539-1  
Type number : 0 460 424 108  
Customer Part-No. :

Customer-specific information  
Customer : NISSAN

Engine : B 4.40 LKW "DI"

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 54.00...56.00  
Electronically : -

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 1.30...1.50  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 24

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 69.50...70.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 5.0  
1000S.: -

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.0  
1000S.: -

Full-load speed regulation

Speed 1/min: 1575  
Del. quantity cm3/  
1000S.: 52.00...56.00  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 95.00...155.00  
mind 1000S.: 95.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 1.30...1.50  
mm: (0.70...2.10)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 0.40...1.00  
mm: (0.00...1.50)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 1300

TD travel mm: 2.60...3.20  
mm: (2.10...3.70)

Shutoff

electromagnet Volt: 24

5th speed 1/min: 1400

TD travel mm: 3.10...3.70  
mm: (2.60...4.20)

Shutoff

electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump pressure bar: 4.50...5.10

Shutoff

electromagnet Volt: 24

2nd speed 1/min: 1100

Supply-pump pressure bar: 6.90...7.50

Shutoff

electromagnet Volt: 24

3rd speed 1/min: 1400

Supply-pump pressure bar: 8.10...8.70

Shutoff

electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff

electromagnet Volt: 24

Overflow quantity cm<sup>3</sup>/10s: 41.70...86.10  
(26.70...98.10)

2nd speed 1/min: 1400

Shutoff

electromagnet Volt: 24

Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
(40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1700

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

2nd speed 1/min: 1525

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 60.0...80.0  
1000S.: -

3rd speed 1/min: 1575

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 52.0...56.0  
1000S.: (48.0...60.0)

4th speed 1/min: 1400

Charge press. hPa: 1200

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 73.5...78.5  
1000S.: (72.0...80.0)

5th speed 1/min: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 73.0...78.0  
1000S.: (71.5...79.5)

6th speed 1/min: 840

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 73.5...74.5  
1000S.: (70.5...77.5)

7th speed 1/min: 500

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 69.5...70.5  
1000S.: (66.5...73.5)

Mech. shutoff:

Mech. Abstellung:

1st speed 1/min: 1400

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (9.00...21.00)

Dispersion cm<sup>3</sup>/: 5.0

1000S.: (5.0)

2nd speed 1/min: 430

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 250

Timing valve Volt: 24

Del. quantity cm<sup>3</sup>/: 50.00...90.00  
1000S.: -



2nd speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...155.00  
1000S.: -

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 95.00...155.00  
1000S.: -

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: KOT
MS	mm: 0.9...1.3
Ya	mm: 37.2...39.2
Yb	mm: 52.7...60.7

Remarks:

:  
:

Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER  
Edition : 19.08.94  
replaces : 11.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1300R240  
Type number : 0 460 426 084  
Customer Part-No. :

Customer-specific information  
Customer : PERKINS

Engine : T6.60 TRUCK

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40.00...48.00  
Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.25  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 0.60...1.00

Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 6.10...6.70  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 98.50...99.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000S.: 86.50...87.50

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 16.50...20.50

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.0  
1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1450  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 47.00...53.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: -  
mind 1000S.: 115.0  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

1st speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 0.6...1.0  
 mm: (0.1...1.5)  
 electromagnet Volt: 24  
 2nd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 1.10...1.90  
 mm: (0.80...2.20)  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1300  
 Charge press hPa: 1000  
 TD travel mm: 2.00...2.80  
 mm: (1.70...3.10)  
 Shutoff  
 electromagnet Volt: 24

# Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.90...4.50  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.10...6.70  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.30...7.90  
 Shutoff  
 electromagnet Volt: 24

# Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700

Charge-air pressure-setting  
 point hPa: 400  
 LDA-stroke mm: 6.3  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 94.00...95.00  
 1000S.: (91.00...98.00)  
 2nd speed 1/min: 1450  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 47.00...53.00  
 1000S.: (44.00...56.00)  
 3rd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 95.0...98.0  
 1000S.: (93.0...100.0)  
 5th speed 1/min: 700  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 98.50...99.50  
 1000S.: (96.00...102.0)  
 6th speed 1/min: 700  
 Charge press. hPa: -  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 86.50...87.50  
 1000S.: (84.00...90.00)

# Mech. shutoff:

# Mech. Abstellung:

1st speed 1/min: 1300  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 24

# Electr. shutoff:

1st speed 1/min: 300  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: -

# Idle delivery:

1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 16.50...20.50  
 1000S.: (13.50...23.50)  
 Dispersion cm<sup>3</sup>/: 5.0  
 1000S.: (5.0)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: -  
3rd speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 2.50...12.50  
1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: ...95.0

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: ...85.0  
1000S.: -

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: ...115

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: KOT
MS1	mm: 1.0...1.3
LDA stroke	mm: 3
Ya	mm: 37.2...39.2
Yb	mm: 50.4...58.6

Remarks:

:  
Ya = Distance between VE flange and  
speed-control lever in idle  
position  
Measurement point = edge of control  
lever on drive end

Yb = Distance between VE flange and  
speed-control lever in rated speed  
position  
Measurement point = edge of control  
lever on distributor-head end